Ray Randolph

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RETURN TO SKYLAB READY ROOM

FAILURE MODE AND EFFECT ANALYSIS AIRLOCK

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VOLUME II (part I)

(Part II is cont. of this Manual)

SUBMITTED UNDER NASA CONTRACT NAS 9-6555

MCDONNELL DOUGLAS ASTRONAUTICS COMPANY
EASTERN DIVISION

MCDONNELL DOUGLAS CORPORATION

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PREFACE

The Airlock Failure Mode and Effect Analysis is documented in three (3) volumes. Volume II presents analysis of Instrumentation System failures in compliance with the requirements of Contract NAS 9-6555, Statement of Work, Appendix D, as specified in Report E855, Airlock Project Reliability Plan, dated 2 March 1970. Analysis of selected second failures of Instrumentation System components is included in accordance with CCP 080 (Contract Amendment 125).

The Single Point Failure List previously included in Volume II is now documented in Reports MDC E0365, Airlock Module Critical Item List, and MDC E0408, Airlock GSE Critical Item List.

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8/3/70	1, 2, 3, 4, 75, 76, 77, 78, 79, 80, 81, 82, 83, 95, 96, 97	10, 11, 44		Revision A	A. J. Gegen	G. W. Krowl
10/30/70	Complete Revision			Revision B Entire Report Retyped.	A. J. Gegen	G. W. Krowl
8/3/71	Complete Revision			Revision C Entire Report Retyped. Single Point Failures Removed Instrumentation System FMEA added.	A. J. Gegen	G. W. Krowl

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1 (610880051) 3.1.01A During a normal mission, this Conv is used for Bus A power. Bus A is normally the PCM Bus.	L M S	a) Loss of +5 volt, +24 volt and -24 volt outputs.	a) Loss of all Bus A power. This results in a loss of power to the Prime Data equipment.	a) (1) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "$PPCO_2$ IN" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316). (2) When the crew switches the "DATA RECORD" switch (located on Panel 204) to the "RECORD" position, the "RECORD" light (green) does not come on.	a) Loss of all R/T and Delayed Prime Data.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew switch to the "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1 (61C880051) (Continued)	L M S	a) Loss of +5 volt output. (±24 volt outputs are normal).	a) Loss of +5 VDC Bus A power. This results in a loss of +5 VDC power to certain sensors and signal conditioners.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT' indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) (1) Ground observes a loss of telemetered temperature and pressure data except for the following: o Mole Sieve Compressor Diff. Pressure (D212 and D216). o Condensate Tank Diff. Pressure (D208). o Partial oxygen Pressure (D37, D239, and D240) o Mole Sieve Inlet and Outlet $PPCO_2$ (D209, D210, D213 and D214). o Mole Sieve Dew point Temp. (C207 & C215) (2) The +5 VDC Bus A Monitor (M513) indicates zero voltage. (3) Questionable data for those signal Conditioners requiring +5 VDC power.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the the crew manually switch to the "3 & 2" Conv/ Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1 (61C880051) (Continued)	L M S	a) Loss of -24 volt and +5 volt outputs. (+24 volt output is normal).	a) Loss of -24 and +5 VDC Bus A power. This results in a loss of power to the PCM System.	a) (1) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316). (2) Questionable readings are noted on the "$PPCO_2$ IN" indicator (located on the Molecular Sieve Panel, Panel 203). Normal readings are observed on the "$PPCO_2$ OUT" indicator.	a) (1) Loss of all R/T Telemetered data. (2) If failure occurs subsequent to the recording of Delayed Prime Data then this Delayed Prime Data is received when the ground dumps the Data. (3) Recorded voice is not affected.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1 (61C380051) (Continued)	L M S	a) Loss of +24 volt and +5 volt outputs. (-24 volt output is normal).	a) Loss of +24 and +5 VDC Bus A power. This results in a loss of power to certain sensors and signal conditioners and to the Prime Data Recorder.	a) (1) The following panel indicators assume the no power (rest) position: o The "PPCO$_2$ IN" and "HT EXCH" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle temperature indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316). (2) When the crew switches the "DATA RECORD" switch (located on Panel 204) to the "RECORD" position, the "RECORD" light (green) does not come on.	a) (1) Ground observes a loss of telemetered pressure and temperature data. (2) The +24 VDC Bus A Monitor (M511) and +5 VDC Bus A Monitor (M513) indicate zero voltage. (3) Data is not received from the Prime Data Recorder and the Prime Data Recorder Tape Motion Monitor channel indicates "NO MOTION". (4) Questionable data from those signal conditioners requiring +24 and/or +5 VDC power.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1, (61C880051) (Continued)	L M S	a) +24 volt output is zero volts and the +5 volt output increases to approximately +8 volts. (-24 volt output is normal).	a) (1) Loss of +24 VDC Bus A power. This results in a loss of power to certain sensors and signal conditioners and to the Prime Data Recorder. (2) The +5 VDC Bus A voltage increases to approximately +8 VDC. No equipment is not damaged by this overvoltage. (3) Erroneous data is received from those sensors and signal conditioners which require +24 and/or +5 VDC Bus A power.	a) (1) The following panel indicators assume the no power (rest) position: o The "$PPCO_2$ IN" and "HT EXCH" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle temperature indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). (2) Full scale or abnormally high readings on the following panel indicators: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316). (3) When the crew switches the "DATA RECORD" switch (located on Panel 204) to the "RECORD" position, the "RECORD" light (green) does not come on.	a) (1) Ground observes a loss of the following data: o Mole Sieve Compressor Diff. Pressure (D212 and D216). o Condensate Tank Diff. Pressure (D208). o Mole Sieve Inlet $PPCO_2$ (D209 and D213). (2) Full scale or abnormally high readings are observed for the remaining pressure and temperature channels requiring +5 VDC Bus A power. (3) Loss of data from the Prime Data Recorder and the Prime Data Recorder Tape Motion Monitor channel indicates "NO MOTION". (4) Questionable data from those signal conditioners requiring +24 and/or +5 VDC Bus A power. (5) The +24 VDC Bus A Monitor (M511) indicates loss of power. (6) The +5 VDC Bus A Monitor (M513) indicates an overvoltage.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter, #1 (610880051) (Continued)	L M S	a) +5 volt output increases to approximately +9 volts. (±24 volt outputs are normal).	a) The +5 VDC Bus A voltage increases to approximately +9 volts. Erroneous data is received from those sensors and signal conditioners which require +5 VDC Bus A power. Equipment is not damaged by this overvoltage.	a) Full scale or abnormally high readings on the following panel indicators: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) (1) Ground observes full scale or abnormally high readings on pressure and temperature channels except for the following: o Mole Sieve Compressor Diff. Pressure (D212 and D216). o Condensate Tank Diff. Pressure (D208). o Partial Oxygen Pressure (D237, D239 and D240) o Mole Sieve Inlet and Outlet PPO_2 (D209, D210, D213 & D214). o Mole Sieve Dew Point Temp (C207 and C215). (2) The +5 VDC Bus A Monitor channel (M513) indicates an overvoltage. (3) Questionable data is received from those signal conditioners requiring +5 VDC Bus A power.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1 (61C880051) (Continued)	L M S	a) +5 volt output decreases to +1.4 volts. (±24 volt outputs are normal).	a) The +5 VDC Bus A voltage decreases to 1.4 volts. Erroneous data is received from those sensors and signal conditioners which require +5 VDC Bus A power.	a) The following panel indicators display abnormally low readings: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) (1) Ground observes abnormally low temperature and pressure readings except for the following: o Mole Sieve Compressor Diff. Pressure (D212 and D216). o Condensate Tank Diff. Pressure (D208). o Partial Oxygen Pressure (D237, D239 and D240). o Mole Sieve Inlet and Outlet $PPCO_2$ (D209, D210, D213 and D214). o Mole Sieve Dew Point Temperature (C207 and C215). (2) Questionable data is observed from those signal conditioners requiring +5 VDC Bus A power. (3) The +5 VDC Bus A Monitor (M13) indicates low voltage.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or the crew can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1 (61C880051) (Continued)	L M S	a) Oscillation of the +5 volt output between zero and +5 volts. (± 24 volt outputs are normal).	a) The +5 VDC Bus A voltage oscillates between zero and +5 volts.	a) Oscillatory readings are displayed on the following panel indicators: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) (1) Ground observes oscillatory temperature and pressure readings except for the following: o Mole Sieve Compressor Diff. Pressure (D212 and D216). o Condensate Tank Diff. Pressure (D208). o Partial Oxygen Pressure (D237, D239 and D240). o Mole Sieve Inlet and Outlet $PPCO_2$ (D209, D210, D213 and D214). o Mole Sieve Dew Point Temperature (C207 and C215). (2) Questionable data is observed from those signal conditioners requiring +5 VDC Bus A power. (3) The +5 VDC Bus A Monitor (M613) indicates oscillating voltage.	a) N/A	-----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1, (61C880051) (Continued)	L M S	a) Loss of -24 volt output. (+24 volt and +5 volt outputs are normal).	a) Loss of -24 VDC Bus A power. This results in a loss of power to the PCM System.	a) Questionable reading is observed on the "$PPCO_2$ IN" indicator (located on the Molecular Sieve Panel, Panel 203). The "$PPCO_2$ OUT" readings are normal.	a) Loss of all telemetered data. Recorded voice is not affected.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1, (61C880051) (Continued)	L M S	a) -24 volt output over spec limit (to a possible -48 volts), and +5 volt output over spec limit (+10 volts). (+24 volt output is normal).	a) (1) The -24 VDC Bus A voltage increases to a possible -48 volts. The Instrumentation System equipment is affected as follows: o The PCM Programmer and Interface Box suffer catastrophic failure. o The Mole Sieve Inlet $PPCO_2$ Sensors suffer catastrophic failure. The Mole Sieve $PPCO_2$ Outlet Sensors are not affected since they are powered by the Caution and Warning System. o The following AM Signal Conditioners may be damaged: oo 61A880051-11, Reg. Bus 1 & 2 (Fine) Voltages (on TM). oo 61A880051-15, Battery Voltages (on TM). oo 61A880061-9, VHF Transponder-Receiver AGC. oo 61A880061-11, Battery (Fine) Current. (2) The +5 VDC Bus A voltage increases to a possible +10 volts. Equipment design is such that it will not be damaged by this overvoltage.	a) (1) Crew observes questionable readings on the "$PPCO_2$ IN" indicator (located on the Molecular Sieve Panel (Panel 203). (2) The "$PPCO_2$ OUT" indicator is not affected. (3) The following indicators display abnormally high or full scale readings: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel , Panel 316).	a) Loss of all TM data. Recorded voice is not affected.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) (1) None. There is a redundant Programmer, a redundant Interface Box Circuit, and a redundant DC-DC Converter. No mission essential measurements require the affected Signal Conditioners. The $PPCO_2$ Outlet measurements are considered adequate for mission continuation. (See Note on next sheet)	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or ground requests that the crew manually, switch to the "3 & 2" Conv/Bus operating mode. This does not restore TM. (2) Ground switches to the Secondary Programmer and Secondary Interface Box or requests that the crew manually do this switching. TM is restored.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1, (61C880051) (Continued)	L M S	(Continued from Sheet 3.1.10) NOTE: Failure indication is such that the ground may suspect the loss of TM data is strictly due to a loss of the Primary Programmer. Switching to the Secondary Programmer prior to switching to an alternate Conv. for Bus A power will result in failure of the Secondary Programmer. This will result in early mission termination due to a loss of TM.					
	L M S	a) +24 volt output over spec limit (to a possible +48 volts) and +5 volt output is zero. (-24 volt output is zero). (Continued on next page)	a) (1) The +24 VDC Bus A voltage increases to a possible +48 volts. The Instrumentation System equipment is affected as follows: o Possible damage to the Prime Data Recorder. o The Mole Sieve Inlet $PPCO_2$ Sensors are damaged. The Mole Sieve $PPCO_2$ Outlet Sensors are not affected since they are powered by the Caution and Warning System. o The following AM Signal Conditioners may be damaged: oo 61A880051-11, Reg.Bus 1 & 2 (Fine) Voltages (on TM). oo 61A880051-15, Battery Voltages (on TM). oo 61A880061-9, VHF Transponder-Receiver AGC. oo 61A880061-11, Battery (Fine) Current. oo 61A880063-3, DCS Verification Pulse. o The 61E880056 pressure transducer will be damaged. This results in a loss of the following parameters: oo H_2O Condensate Tank Diff. Press. oo Mole Sieve A/B - Compressor ΔP.	a) (1) Crew observes questionable (high) readings on the following panel indicators: o The "MT EXCH" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle temperature indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "VENT TEMP" indicator (located on the Condensate Control Panel, Panel 216). (2) Questionable readings, perhaps zero, on the following panel indicators: o The "$PPCO_2$ IN" indicator (located on the Molecular Sieve Panel, Panel 203). o The "TANK ΔP" indicator (located on the Condensator Control Panel, Panel 216). (3) Crew observes normal readings on the "$PPCO_2$ OUT" indicator (located on the Molecular Sieve Panel, Panel 203). (4) Crew observes no power (rest) readings on the following panel indicators:	a) (1) Possible loss of delayed Prime Data. (2) Abnormal H_2O Condensate Tank Differential Pressure (D208), perhaps zero. (3) Abnormal Mole Sieve $PPCO_2$ Inlet indication (D209 and/or D213), perhaps zero. (4) Normal Mole Sieve $PPCO_2$ Outlet indication (D210 and/or D214). (5) Questionable data from those Signal Conditioners requiring +24 VDC and/or +5 VDC Bus A power. (6) No power indication from those Pressure Transducers and Temperature Sensors requiring +5 VDC power. (7) +24 Volt Bus A Monitor indicates excessive voltage (M511). (8) +5 Volt Bus A Monitor indicates zero voltage (M513).	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #1, (610880051) (Continued)	L M S			o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).			
		b) Defective component due to mechanical or thermal stress.	b) None. Crew or ground can switch to alternate Conv. for Bus A power. No mission essential parameters are lost. Prime Data can be recorded on an alternate Recorder. Damaged Recorder can be replaced by on board spare recorder.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode. (3) If Recorded Prime Data is not received, ground requests that the crew replace the Recorder with an on board spare.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #2 (61C880051) 3.1.01B During a normal mission, this Conv is used for Bus B power. Bus B is normally the Exp Rcdr Bus	L M S	a) Loss of +5 volt, +24 volt and -24 volt outputs.	a) Loss of all Bus B power. This results in a loss of power to the Experiment Recorders.	a) (1) When the crew attempts to record Exp 1 or Exp 2 data, the respective STS and OWS "RECORD" lights (green) do not come on.	a) (1) Data is not received from the Exp 1 and Exp 2 Recorders. (2) The Tape Motion Monitor channels for Exp 1 and Exp 2 Recorders indicate NO MOTION. (3) The following Bus Monitor channels indicate zero voltage: o +24 VDC Bus B (M520) o -24 VDC Bus B (M521) o - 5 VDC Bus B (M522	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching required to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The STS Exp 1 and Exp 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #2 (610880051) (Continued)	L M S	a) Loss of +5 volt output. (±24 volt outputs are normal).	a) Loss of +5 VDC Bus B power. No effect on the system, +5 VDC Bus B power is not used during a normal mission.	a) None.	a) The +5 VDC Bus B Monitor channel (M522) indicates zero voltage.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) Ground can switch to the 1A/3B Conv/Bus operating mode if desired, or (2) Ground requests that the crew manually switch to the Conv/Bus operating mode.	b) IIIb	
	L M S	a) Loss of -24 volt and +5 volt outputs. (+24 volt output is normal).	a) Loss of -24 and +5 VDC Bus B power. No effect on the system, -24 and +5 VDC Bus B power is not used during a normal mission.	a) None.	a) The following Bus Monitor channels indicate zero voltage: o -24 VDC Bus B (M521) o +5 VDC Bus B (M522)	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) If desired, the ground can switch to the 1A/3B Conv/Bus operating mode or request that the crew manually switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #2 (61C850001) (Continued)	L M S	a) Loss of +24 volt and +5 volt outputs. (-24 volt output is normal).	a) Loss of +24 and +5 VDC Bus B power. This results in a loss of power to the Experiment Recorders.	a) When the crew attempts to record Exp 1 or Exp 2 data, the respective STS and OWS "RECORD" lights (green) do not come on.	a) (1) Data is not received from the Exp 1 or Exp 2 Recorders. (2) The Tape Motion Monitor channels for Exp 1 and Exp 2 Recorders indicate NO MOTION. (3) The following Bus Monitor channels indicate zero voltage: o +24 VDC Bus B (M520) o + 5 VDC Bus B (M522)	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The STS Exp 1 and Exp 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	
	L M S	a) +24 volt output is zero volts and +5 volt output increases to approximately +8 volts. (-24 volt output is normal).	a) (1) Loss of +24 VDC Bus B power. This results in a loss of power to the Experiment Recorders. (2) The +5 VDC Bus B voltage increases to +8 volts. This does not affect the system as +5 VDC Bus B is not functional during a normal mission.	a) When the crew attempts to record Exp 1 or Exp 2 data, the respective STS and OWS "RECORD" lights (green) do not come on.	a) (1) Data is not received from the Exp 1 or Exp 2 Recorders. (2) The Tape Motion Monitor channels for Exp 1 or Exp 2 Recorders indicate NO MOTION. (3) The +24 VDC Bus B Monitor channel (M520) indicates zero voltage. (4) The +5 VDC Bus B Monitor channel (M522) indicates an overvoltage.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #2 (610850001) (Continued)	L M S	b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The AM Exp 1 & Exp 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	
	L M S	a) +5 volt output increases to approximately +9 volts. (±24 volt outputs are normal).	a) The +5 VDC Bus B voltage increases to approximately +9 volts. This does not affect the system as +5 VDC Bus B is not functional during a normal mission.	a) None.	a) The +5 VDC Bus B Monitor channel (M522) indicates an overvoltage.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) Ground switches to the 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	
	L M S	a) +5 volt output decreases to +1.4 volts. (±24 volt outputs are normal).	a) The +5 VDC Bus B voltage decreases to 1.4 volts. This does not affect the system as +5 VDC Bus B is not functional during a normal mission.	a) None.	a) The +5 VDC Bus B Monitor channel (M522) indicates Bus B voltage is +1.4 volts.	a) N/A	----
		b) Defective component is due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) Ground switches to the 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
DC-DC Converter #2 (61C880051) (Continued)	L M S	a) Loss of -24 volt output. (+24 volt and +5 volt outputs are normal).	a) Loss of -24 VDC Bus B power. This does not affect the system as -24 VDC Bus B is not functional during a normal mission.	a) None.	a) The -24 VDC Bus B Monitor channel (M521) indicates zero voltage.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) Ground switches to the 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	
	L M S	a) -24 volt output over spec limit (to a possible -48 volts) and +5 volt output over spec limit (+10 volts). (+24 volt output is normal).	a) The -24 VDC Bus B voltage increases to as much as -48 volts. During a normal mission, the Dummy Load Resistor (RER-70, 75.0 ±1%) is the only equipment connected to Bus B during a normal mission. This resistor may fail open due to this overvoltage. When alternate Conv is turned on for Bus B power, the loss of the -24 volt dummy load for Bus B results in a loss of -24 volt regulation. The other outputs are not affected. The Conv is not damaged by this loss of regulation.	a) None.	a) (1) The -24 VDC Bus B Monitor channel (M521) indicates an overvoltage. (2) The +5 VDC Bus B Monitor channel (M522) indicates an overvoltage.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) The ground switches to 1A/3B Conv/Bus operating mode, or (2) The ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGOR:	RECOMMENDATIONS
DC-DC Converter #2 (61C080051) (Continued)	L M S	a) +24 volt output over limit (to a possible +48 volts) and the +5 volt output is zero. (-24 volt output is zero).	a) The +24 VDC Bus B voltage increases to as much as +48 volts. This results in possible damage to the Exp 1 and/or Exp 2 Recorders. The damaged Recorder(s) can be replaced with on-board spare Recorder(s).	a) None.	a) (1) Data is not received from the Exp 1 or Exp 2 Recorders. (2) The +24 VDC Bus B Monitor channel (M520) indicates an overvoltage. (3) The +5 VDC Bus B Monitor channel (M522) indicates zero voltage.	a) N/A	----
		b) Defective component due to mechanical or thermal stress.	b) None. Ground or crew can perform switching required to circumvent the problem.	b) None.	b) (1) Ground switches to the 1A/3B Conv/Bus operating mode, or the ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode. (2) If the Conv switch does not restore Exp. Recorder operation, the ground switches to the Prime Data Recorder for Exp data. This restores Exp. data. The ground then requests that the crew remove the damaged Recorder(s) and install spare Recorder(s).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DC/DC CONVERTER 1" (3-1) (52-79721-316) (Located on the STS Overhead Circuit Breaker Panel, Panel 200) 3.1.02	L M S	a) Open before normal break current is exceeded.	a) Loss of power to DC-DC Conv #1. This results in a loss of Bus A power which is necessary for Prime Data Transmission/Recording.	a) (1) The following panel indicators assume the no power (rest) position when Prime Data is being Recorded and/or Transmitted: o The "HT EXCH" and "$PPCO_2$ IN" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316). (2) The "DC-DC CONVERTER 1" circuit breaker bat handle is in the open position. (3) When the crew switches the "DATA" Record switch (located on Panel 204) to the "RECORD" position, the "RECORD" light (green) does not come on.	a) Loss of all R/T and Recorded Prime Data.	a) N/A	----
		b) Internal defect, coil short to ground.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew attempts to reset the circuit breaker. (2) If circuit breaker will not reset, crew notifies the ground on the anomaly. (3) Crew can manually select the "3 & 2" Conv/Bus operating mode.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DC/DC CONVERTER 2" (3-9) (52-79721-316) (Located on the STS Overhead Circuit Breaker Panel, Panel 200) 3.1.03	L M S	a) Opens before normal break current is exceeded.	a) Loss of power to DC-DC Conv #2. This results in a loss of power to the Experiment Recorders.	a) (1) When the crew switches an Exp 1 or Exp 2 switch to the "RECORD" position, the respective STS and OWS Experiment Record Lights (green) do not light up. (2) The "DC/DC CONVERTER 2" circuit break bat handle is in the open position.	a) (1) Loss of data from the Experiment Recorders. (2) The following Bus Mointor channels indicate zero voltage: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 - 5 VDC Bus B (M522) (3) The T/R 2 Tape Motion Monitor (K509) and/or T/R 3 Tape Motion Monitor (K510) indicate no tape motion. (Assuming T/R 2 is Exp 1 Recdr and T/R 3 is Exp 2 Recdr).	a) N/A	----
		b) Internal defect, coil short to ground.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew attempts to reset the Conv # 2 circuit breaker. (3) Crew informs ground of the anomaly. (4) Crew can manually select the "1 & 3" Conv/Bus operating mode.	b) (1) Ground switches to the 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "MANUAL CONTROLS CONV" (3-59) (52-79721-322)	L M S	a) Opens before normal break current is exceeded.	a) Loss of crew capability to manually select the Conv/Bus operating mode.	a) The "MANUAL CONTROLS CONV" circuit breaker bat handle is in the open position.	a) None.	a) N/A	----
(Located on the STS Overhead Circuit Breaker Panel, Panel 200) 3.1.04		b) Internal defect, coil short to ground.	b) None. Conv/Bus operating mode is normally controlled by the ground (DCS).	b) (1) Crew attempts to reset the circuit breakers. (2) Crew notifies ground of the anomaly.	b) None.	b) IIIb	
This circuit breaker provides power to the Man/Cmd Conv Cntl Mode relay coils and to the Man Conv/Bus Operating mode relay coils.							

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DC-DC CONVERTER 3" (3-57) (52-79721-316) (Located on the STS Overhead Circuit Breaker Panel, Panel 200) 3.1.05	L M S	a) Opens before normal break current is exceeded. b) Internal defect, coil short to ground.	a) None. Conv #3 is needed only in the event of a loss of Conv #1 or Conv #2 power for Bus a and Bus B respectively. b) None.	a) The "DC/DC CONVERTER 3" circuit breaker bat handle is in the open position. b) (1) Crew attempts to reset the Conv #3 circuit breaker. (2) Crew informs ground of the anomaly.	a) None. b) None.	a) N/A b) N/A Double Failure	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv. #1/Bus A Man. Cntl. Relay #1" (K3-26) (52-79703-79) 3.1.07 For a normal mission, Bus A is powered from Conv #1. This relay is used to control the application of power to Conv #1 for crew commanded functions requiring Bus A power.	M	a) (1) Latch coil fails open, or (2) Pole B fails open in the reset position.	a) Power is not applied to Conv #1 when the crew manually commands a function requiring Bus A power. This results in a loss of power to the PCM System.	a) When the crew switches the "DATA" Record switch (located on Panel 204) to the "RECORD" position, the "RECORD" light (green) does not come on.	a) When the ground dumps data from the Prime Data Recorder, the data obtained in incomplete or missing in its entirety.	a) N/A	----
		b) (1) Defective wire or terminal due to mechanical or thermal stress, or (2) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) There is loss of power to Conv #1 when the crew manually commands a function requiring Bus A power. This results in a loss of Bus A power.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "PPCO$_2$ IN" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). o The "LOCK", "AFT", and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) When the ground dumps data from the Prime Data Recorder, the data obtained is incomplete or missing in its entirety.	a) N/A	----

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #1/Bus A Man. Cntl. Relay #1" (K3-26) (52-79703-79) (Continued)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode.	b) IIIb	
	M	a) Pole D fails open in the latch position.	a) When Bus A is powered-up, the Display Converter does not turn off. Display Converter power continues to be supplied to the panel display sensors. Overall system operation is not affected.	a) None.	a) None.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None, other than what additional power may be required for the Display Converter.	b) None.	b) None.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) The Display Converter does not receive power when Bus A is powered-down. This results in a loss of power to certain indicator sensors when Bus A is powered-down.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "$PPCO_2$" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). o The "LOCK", "AFT", and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) None.	a) N/A	-----

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #1/Bus A Man. Cntl. Relay #1" (K3-26) (52-79703-79) (Continued)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode, or (3) Ground switches to Bus B power for the PCM System and Transducers and Bus A power for the Experiment Recorders.	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) None. Not functional in this position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Reset coil fails open. b) Defective terminal of wire due to mechanical or thermal stress. OR, a) Pole B fails open in the latch position.	a) Power cannot be removed from DC-DC Conv #1 by relay switching. b) None. The equipment is designed to withstand continuous operation. Crew can remove power by opening Conv #1 circuit breaker.	a) None. b) None.	a) None, except that the temperature of affected Conv may be higher than expected after periods when the Conv was supposed to have been powered-down. b) Ground switches to an alternate DC-DC Conv for Bus A power and asks the crew to open the circuit breaker for the affected Conv.	a) N/A b) IIIb	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #2 (or #3)/ Bus A Man. Cntl. Relay #1" (K3-30 or K3-34) (Any 1 of 2) (52-79703-79) 3.1.08 3.1.09 If Bus A is powered from Conv. #2 (or #3), this relay is used to control the application of power to Conv #2 (or #3) for crew commanded functions requiring Bus A power.	M	a) Pole D fails open in the reset position.	a) The Display Converter does not receive power when Bus A is powered-down. This results in a loss of power to certain panel indicator sensors when Bus A is powered-down.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "PPCO$_2$ IN" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK", and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel , Panel 216). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) None.	a) N/A	----
NOTE - For a normal mission, Bus A is powered from Conv #1.		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform necessary switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to Bus B power for the PCM System and Transducers and to Bus A power for the Experiment Recorders.	b) IIIb	
	M	a) Pole D or Pole C or Pole B fails open in the latch position.	a) None. The latch position is used only in the event of a prior failure which then requires that Conv #2 (or Conv #3) be used for Bus A power.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #2 (or #2) Bus A Man. Cntl. Relay #1" (K3-30 or K3-34) (Any 1 of 2) (52-79703-79) (Continued)	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole B fails open in the reset position.	a) Relay cannot be cycled to the latch position. No effect. The latch position is used only in the event of a prior failure which then requires that Conv # 2 (or Conv #3) be used for Bus A power.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	M	a) Pole C fails open in the reset position.	a) None. Pole C is not functional in the reset position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Reset coil fails open.	a) None. This relay is in the reset position prior to lift-off and remains in this position during a normal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #2 (or #3) Bus A Man. Cntl. Relay #1" (K3-30 or K3-34) (Any 1 of 2) (52-79703-79)	M	a) Latch coil fails open.	a) Relay cannot be cycled to the latch position. No effect. The latch position is used only in the event of a prior failure which then requires that Conv #2 (or Conv #3) be used for Bus A power.	a) None.	a) None.	a) N/A	----
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Conv #1/Bus A Mun. Cntl. Relay #2" (K3-27) (52-79715-11) 3.1.10	M	a) Coil fails open.	a) "Conv #1/Bus A Man. Cntl. Relay #1" (K3-26) cannot be cycled from its state at the time the coil fails open. Assuming a normal mission with Conv #1 supplying power to Bus A: o If Relay K3-26 is in the reset position, power is not applied to Conv #1 when the crew commands a function requiring Bus A power. This results in a loss of power to the PCM System. o If Relay K3-26 is in the latch position, power is not removed from Conv #1 when the crew removes the command(s) which require Bus A power. Equipment is not damaged by the continuous application of power.	a) (1) With Relay K3-26 in the reset position, if crew switches the DATA Record switch (located on Panel 204) to the "RECORD" position, the "RECORD" light (green) does not come on. (2) With Relay K3-26 in the latch position, there is no indication of the failure.	a) (1) With Relay K3-26 in the reset position, when ground executes a dump from the Prime Data Recorder ground observes missing data if crew gave the "RECORD" command. (2) With Relay K3-26 in the reset position, ground does not receive data when crew commands R/T TM transmission. (3) With Relay K3-26 in the latch position, the temperature of Conv #1 may be higher then expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
This relay is used for cycling "Conv #1/Bus A Mun. Cntl. Relay #1 (K3-26). These two relays are needed for manual control of Bus A power when Conv #1 is supplying power to Bus A.		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) If Relay K3-38 in the reset position, ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode or, ground requests that the crew manually switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode. (2) If Relay K3-26 is in the latch position, ground switches to the 3A/2B Conv/Bus operating mode, or ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode. Ground requests that the crew OPEN the circuit breaker for Conv #1.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Conv #1/Bus A Man. Cntl. Relay #2" (K3-27) (52-79715-11) (Continued)	M	a) Pole A fails open when coil is energized.	a) "Conv #1/Bus A Man. Cntl. Relay #1" (K3-26) cannot be cycled to the latch position. This results in power not being applied to Conv #1 when the crew commands a function requiring Bus A power. Prime Data equipment uses Bus A power during a normal mission.	a) If crew switches the DATA Record switch (located on Panel 204) to the "RECORD" position, the "RECORD" light (green) does not come on.	a) (1) When ground executes a dump from the Prime Data Recorder, ground observes missing data if crew gave the "RECORD" command. (2) Ground does not receive data when crew commands R/T TM transmission.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode.	b) IIIb	
	M	a) Pole B fails open when coil is energized.	a) "Conv #1/Bus A Man Cntl. Relay #1" (K3-26) cannot be cycled to the reset position. Power is not removed from Conv #1. Equipment is not damaged by the continuous application of power.	a) None.	a) None, except that the temperature of Conv #1 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can perform switching required to circumvent the problem.	b) None.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew switch to the "3 & 2" Conv/Bus operating mode. (3) Ground requests that the crew OPEN the circuit breaker for Conv #1.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #2/Bus B Man. Cntl. Relay #1" (K3-32) (52-79703-79) 3.1.13	M	a) (1) Latch coil fails open, or (2) Pole B fails open in the reset position or Pole C fails open in the latch position.	a) There is a loss of power to Conv #2 when the crew manually commands a function requiring Bus B power. This results in a loss of power to the Experiment Recorders.	a) When the crew switches an Exp 1 or Exp 2 switch to the "RECORD" position, the respective STS and OWS Experiment Record Lights (green) do not light up.	a) (1) When ground attempt to dump data from the Experiment Recorder(s), data is not received. (2) The following Bus Monitor channels indicate zero voltage when crew commands a function requiring the Experiment Recorders: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 +5 VDC Bus B (M522)	a) N/A	----
For a normal mission, Bus B is powered from Conv #2. This relay is used to control the application of power to Conv #2 for crew commanded functions requiring Bus B power.		b) (1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The STS Exp 1 and Exp 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breaker for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 2A/1B or 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew switch to the "2 & 1" or "1 & 3" Conv/Bus operating mode.	b) IIIb	
	M	a) (1) Reset coil fails open, or (2) Pole B fails open in the latch position. (Continued on next page)	a) Power cannot be removed from Conv #2 by relay switching. The Conv is not damaged by the continuous application of power.	a) None.	a) (1) The following Bus Monitor channels indicate Bus B is powered-up even though the Experiment Recorders are powered-down: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 +5 VDC Bus B (M522) (2) Temperature of Conv #2 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Conv #2/Bus B Mun. Cntl. Relay #1" (52-79703-79) (Continued)		b) (1) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew can perform switching to circumvent the problem.	b) None.	b) (1) Ground requests that the crew open the circuit breaker for Conv #2.	b) IIIb	
		(2) Insulating film on contacts due to contamination.			(2) Ground switches to the 1A/3B Conv/Bus operating mode or requests that the crew switch to the "1 & 3" Con/Bus operating mode.		
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None. Pole C is not functional in the reset position.	a) None.	a) None.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole D fails open in the reset or latch position.	a) None. Bus A is the Prime Data Bus during a normal mission. Pole D is functional only when Bus B is used as the Prime Data Bus.	a) None.	a) None.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Conv #2/Bus B Man. Cnt. Relay #2" (K3-33) (52-79715-11) 3.1.16 This relay is used for cycling "Conv #2/Bus B Man. Cntl. Relay #1" (K3-32). These two relays (K3-32 & K3-33) are needed for manual control of Bus B power when Conv #2 is supplying power to Bus B.	M	a) Coil fails open.	a) "Conv #2/Bus B Man. Cntl. Relay #1" (K3-32) cannot be cycled from its state at the time the coil fails open. Assuming a normal mission with Conv #2 supplying power to Bus B: o If Relay K3-32 is in the reset position, power is not applied to Conv #2 when the crew commands a function requiring Bus B power. This results in a loss of power to the Experiment Recorders. o If Relay K3-32 is in the latch position, power is not removed from Conv #2 when the crew removes the command(s) which require Bus B power. The Conv is not damaged by the continuous application of power.	a) (1) With Relay K3-32 in the reset position, when the crew attempts to record Exp 1 or Exp 2 data, the respective STS and OWS "RECORD" lights (green) do not come on. (2) With Relay K3-32 in the latch position, there is no indication of the failure.	a) (1) With Relay K3-32 in the reset position, ground does not receive data when a DCS Exp 1 or Exp 2 data dump execute command is given. Bus Monitor channels indicate Bus B is powered-up and Tape Motion Monitor channels indicate "MOTION". (2) With Relay K3-32 in the reset position, when crew commands Exp 1 or Exp 2 record or dump, the following Bus Monitor channels indicate zero voltage: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 +5 VDC Bus B (M522) The Tape Motion Monitor channels (K509 & K510). (3) With Relay K3-32 in the latch position, the following Bus Monitor channels indicate Bus B is continuously powered-up: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 +5 VDC Bus B (M522) The temperature of Conv #2 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Conv #2/Bus B Man. Cntl. Relay #2" (K3-33) (52-79715-11) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The STS Exp 1 & Exp 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) If Relay K3-32 is in the reset position, ground switches to the 2A/1B or 1A/3B Conv/Bus operating mode or ground requests that the crew manually switch to the "2 & 1" or "1 & 3" Conv/Bus operating mode. (2) If Relay K3-32 is in the latch position, ground switches to the 1A/3B Conv/Bus operating mode or ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode. Ground requests that the crew OPEN the circuit breaker for Conv #2.	b) IIIb	
	M	a) Pole A fails open when the coil is energized.	a) "Conv #2/Bus B Man. Cntl. Relay #1" (K3-32) cannot be cycled to the latch position. This results in power not being applied to Conv #2 when the crew commands a function requiring Bus B power. The Experiment Recorders use Bus B power during a normal mission.	a) When the crew attempts to record Exp 1 or Exp 2 data, the respective STS and OWS "RECORD" lights (green) do not come on.	a) (1) Ground does not receive Exp 1 or Exp 2 data when they command a data dump. The Bus Monitor channels for Bus B indicate normal voltages. (2) When crew commands Exp 1 or Exp 2 data record or data transmit, the following Bus Monitor channels indicate zero voltage: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 +5 VDC Bus B (M522)	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The STS Exp. 1 & Exp. 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 2A/1B or 1A/3B Conv/Bus operating mode, or (2) The ground requests that the crew manually switch to the "2 & 1" or "1 & 3" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release "Conv #2/Bus B Man. Cntl. Relay #2 (K3-33) (52-79715-11) (Continued)	M	a) Pole B fails open when the coil is energized.	a) "Conv #2/Bus B Man. Cntl. Relay #1" (K3-32) cannot be cycled to the reset position. Power is not removed from Conv #2. Equipment is not damaged by the continuous application of power.	a) None.	a) (1) The following Bus Monitor channels indicate that Bus B is continuously powered-up: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 +5 VDC Bus B (M522) (2) The temperature of Conv #2 may be higher than expected after periods when the Conv is supposed to have been powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) Ground switches to the 2A/1B or 1A/3B Conv/Bus operating mode, or (2) The ground requests that the crew manually switch to the "2 & 1" or "1 & 3" Conv/Bus operating mode. (3) Ground requests that the crew open the circuit breaker for Conv #2.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #1/Bus A DCS Cntl. Relay #1" (K3-38) (52-79703-79) 3.1.19 For a normal mission, Bus A is powered from Conv #1. This relay is used to control the application of power to Conv #1 for crew commanded functions requiring Bus A power.	L M S	a) (1) Latch coil fails open, or (2) Pole B fails open in the reset position.	a) There is a loss of power to Conv #1 when the ground commands a function requiring Bus A power. This results in a loss of Bus A power.	a) None.	a) (1) Data is not received when the ground gives the command (via DCS) to: o Transmit R/T TM. o Dump data or data and voice from the Prime Data Recorder. (2) Data is received if ground uses the Back-up R/T TM command.	a) N/A	----
		b) (1) Defective wire or terminal due to mechanical or thermal stress, or (2) Insulating film on contacts due to contamination.	b) None. Ground or crew can perform the switching to circumvent the problem.	b) None.	b) (1) Ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None. Pole C is not functional in the reset position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #1/Bus A DCS Cntl. Relay #1" (K3-38) (52-79703-79) (Continued)	L M S	a) Pole C fails open in the latch position.	a) There is a loss of power to Conv #1 when the ground commands a function requiring Bus A power. This results in a loss of Bus A power.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "$PPCO_2$ IN" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK", and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) (1) Data is not received when the ground gives the command (via DCS) to: o Transmit R/T TM. o Dump data or data and voice from the Prime Data Recorder. (2) Data is received if ground uses the Backup R/T TM command.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform the switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Conv #1/Bus A DCS Cntl. Relay #1" (K3-38) (52-79703-79) (Continued)	M	a) Pole D fails open in the reset position.	a) The Display Converter does not receive power when Bus A is powered-down. This results in a loss of power to certain panel indicator sensors when Bus A is powered-down.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "PPCO$_2$ IN" indicators (located on the Molecular Sieve Panel, Panel 203). o The O$_2$/N$_2$ bottle pressure and temperature, the O$_2$/N$_2$ pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on the O$_2$/N$_2$ Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). o The "LOCK", "AFT" and "O$_2$" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316)	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switch to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode. (3) Ground switches to Bus B power for the PCM System and Transducers and Bus A power for the Experiment Recorders.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Conv #1/Bus A DCS Cntl. Relay #1" (K3-38) (52-79703-61) (Continued)	M	a) Pole D fails open in the latch position.	a) When Bus A is powered-up, the Display Converter does not turn off. Display Converter power continues to be supplied to the panel display sensors. Overall system operation is not affected.	a) None.	a) None.	a) N/A	----
			b) None, other than what additional power may be required for the Display Converter.	b) None.	b) None.	b) IIIb	
	L M S	a) (1) Reset coil fails open, or (2) Pole B fails open in the reset position.	a) Power cannot be removed from DC-DC Conv #1 by relay switching.	a) None.	a) None, except that the temperature of Conv #1 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
		b) (1) Defective wire or terminal due to mechanical or thermal stress.	b) None. The equipment is designed to withstand continuous operation. Crew can remove power by opening Conv #1 circuit breaker.	b) None.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or (2) Ground requests that the crew switch to the "3 & 2" Conv/Bus operating mode. (3) Ground requests that the crew open the circuit breaker for Conv #1.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #2 or (#3)/ Bus A DCS Cntl. Relay #1" (K3-42 or K3-46) (Any 1 of 2) (52-79703-79) 3.1.20 3.1.21 If Bus A is powered from Conv #2 (or #3) this relay is used to control the application of power to Conv #2 (or #3) for crew commanded functions requiring Bus A power.	M	a) Pole D fails open in the reset position.	a) The Display Converter does not receive power when Bus A is powered-down. This results in a loss of power to certain panel indicator sensors when Bus A is powered-down.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "PPCO$_2$ IN" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) None.	a) N/A	----
NOTE - For a normal mission, Bus A is powered from Conv #1.		b) Insulating film on contacts due to contamination.	b) None. Ground can perform necessary switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to Bus B power for the PCM System and Transducers and to Bus A power for the Experiment Recorders.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #2 (or #3)/ Bus A DCS Cntl. Relay #1" (K3-42 or K3-46) (Any 1 of 2) (52-79703-79) (Continued)	L M S	a) Pole D or Pole C or Pole B fails open in the latch position.	a) None. The latch position is used only in the event of a prior failure which then requires that Conv #2 (or Conv #3) be used for Bus A power.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) Relay cannot be cycled to the latch position. No effect. The latch position is used only in the event of a prior failure which then requires that Conv #2 (or Conv #3) be used for Bus A power.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Pole C fails open in the reset position.	a) None. Pole C is not functional in the reset position.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #2 (or #3)/ Bus A DCS Cntl. Relay #1" (K3-42 or K3-46) (Any 1 of 2) (52-79703-79) (Continued)	L M S	a) Reset coil fails open.	a) None. This relay is in the reset position prior to lift-off and remains in this position during a normal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) Relay cannot be cycled to the latch position. No effect. The latch position is used only in the event of a prior failure which then requires that Conv #2 (or Conv #3) be used for Bus A power.	a) None.	a) None.	a) N/A	
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Conv #1/Bus A DCS Cntl. Relay #2" (K3-39) (52-79715-11) 3.1.22 This relay is used for cycling "Conv #1/Bus A DCS Cntl. Relay #1 (K3-38). These two relays are needed for DCS control of Bus A power when Conv #1 is supplying power to Bus A.	L M S	a) Coil fails open.	a) "Conv #1/Bus A DCS Cntl. Relay #1" (K3-38) cannot be cycled from its state at the time the coil fails open. Assuming a normal mission with Conv #1 supplying power to Bus A: o If Relay K3-38 is in the reset position, power is not applied to Conv #1 when the ground commands a function requiring Bus A power. This results in a loss of power to the PCM System. o If Relay K3-38 is in the latch position, power is not removed from Conv #1 when the ground removes the command(s) which require Bus A power. Equipment is not damaged by continuous application of power.	a) None.	a) (1) With Relay K3-38 in the reset position, when ground executes a dump from the Prime Data Recorder or R/T TM transmission, data is not received. (2) With Relay K3-38 in the latch position, the temperature of Conv #1 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) (1) If Relay K3-38 in the reset position, ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode, or ground requests that the crew manually switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode. (2) If Relay K3-26 is in the latch position, ground switches to the 3A/2B Conv/Bus operating mode, or ground requests that the crew manually switch to the "3 & 2" Conv/Bus operating mode. Ground requests that the crew OPEN the circuit breaker for Conv #1.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Conv #1/Bus A DCS Cntl. Relay #2" (K3-39) (52-79715-11)	L M S	a) Pole A fails open when coil is energized.	a) "Conv #1/Bus A DCS Cntl. Relay #1" (K3-38) cannot be cycled to the latch position. This results in power not being applied to Conv #1 when the ground commands a function requiring Bus A power.	a) None.	a) (1) When ground executes a dump from the Prime Data Recorder or R/T TM transmission, data is not received.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) Ground switches to the 2A/1B or 3A/2B Conv/Bus operating mode, or ground requests that the crew switch to the "2 & 1" or "3 & 2" Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole B fails open when coil is energized.	a) "Conv #1/Bus A DCS Cntl. Relay #1" (K3-38) cannot be cycled to the reset position. Power is not removed from Conv #1. Equipment is not damaged by the continuous application of power.	a) None.	a) None, except that the temperature of Conv #1 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) (1) Ground switches to the 3A/2B Conv/Bus operating mode, or ground requests that the crew switch to the "3 & 2" Conv/Bus operating mode. (2) Ground requests that the crew OPEN the circuit breaker for Conv #1.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #2/Bus B DCS Cntl. Relay #1" (K3-44) (52-79703-79) 3.1.25	L M S	a) 1. Latch coil fails open, or 2. Pole B fails open in the reset position or Pole C fails open in the latch position.	a) There is a loss of power to Conv #2 when the ground commands a function requiring Bus B power. This results in a loss of power to the Experiment Recorders.	a) None.	a) (1) When the ground attempts to dump data from the Experiment Recorder(s), data is not received. (2) The following Bus Monitor channels indicate zero voltage when the ground commands a data dump from the Experiment Recorder(s): o + 24 VDC Bus B (M520) o - 24 VDC Bus B (M521) o + 5 VDC Bus B (M522)	a) N/A	
		b) 1. Defective wire or terminal due to mechanical or thermal stress. 2. Insulating film on contacts due to contamination	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) 1. Ground switches to the 2A/1B or 1A/3B Conv/Bus operating mode. 2. Ground requests that the crew switch to the "2 & 1" or "1 & 3" Conv/Bus operating mode.	b) IIIb	
For a normal mission, Bus B is powered from Conv #2. This relay is used to control the application of power to Conv #2 for ground commanded functions requiring Bus B power.	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) None. Pole C is not functional in the reset position.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv #2/Bus B DCS Cntl. Relay #1" (K3-44) (52-79703-79)	L M S	a) Pole D fails open in the reset or latch position.	a) None. Bus A is the Prime Data Bus during a normal mission. Pole D is functional only when Bus B is used as the Prime Data Bus.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) 1. Reset coil fails open, or 2. Pole B fails open in the latch position.	a) Power cannot be removed from Conv. #2 by relay switching. The Conv is not damaged by the continous application of power	a) None.	a) 1. The following Bus Monitor channels indicate Bus B is powered-up even though the Experiment Recorders are powered-down: o +24 VDC Bus B (M520) o -24 VDC Bus B (M521) o + 5 VDC Bus B (M522) 2. Temperature of Conv #2 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	
		b) 1. Defective wire or terminal due to mechanical or thermal stress. 2. Insulating film on contacts due to contamination	b) None. Crew can perform switching to circumvent the problem.	b) None.	b) 1. Ground requests that the crew open the circuit breaker for Conv #2. 2. Ground switches to the 1A/3B Conv/Bus operating mode or requests that the crew switch to the "1 & 3" Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, SLOW Release, "Conv #2/Bus B DCS Cntl Relay #2" (K3-45) (52-79715-11) 3.1.28 This relay is used for cycling "Conv #2/Bus B DCS Cntl. Relay #1" (K3-44). These two relays (K3-44 & K3-45) are needed for DCS control of Bus B power when Conv #2 is supplying power to Bus B.	L M S	a) Coil fails open.	a) "Conv #2/Bus B DCS Cntl Relay #1" (K3-44) cannot be cycled from its state at the time the coil fails open. Assuming a normal mission with Conv #2 supplying power to Bus B: o If Relay K3-44 is in the reset position, power is not applied to Conv #2 when the ground commands a dump of Exp 1 or Exp 2 data. This results in a loss of power to the Experiment Recorders. Experiment Recorder manual commands are not affected. o If Relay K3-44 is in the latch position, power is not removed from Conv #2 when the ground removes the Exp 1 or Exp 2 data dump command. The conv is not damaged by the continuous application of power.	a) None.	a) 1. With Relay K3-44 in the reset position, the ground does not receive data when a DCS Exp 1 or Exp 2 data dump execute command is given. The Bus Monitor channels (M520, M521, M522) indicate Bus B is not powered-up and the tape motion monitor channels (K509 & K510) indicate "No Motion". Experiment recorder data is received if crew manually commands the dump. 2. With Relay K3-44 in the latch position, the following Bus Monitor channels indicate Bus B is continuously powered-up: o +24 VDC Bus B (M520). o -24 VDC Bus B (M521). o + 5 VDC Bus B (M522). The temperature of Conv. #2 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) 1. If Relay K3-44 is in the reset position, ground switches to the 2A/1B or 1A/3B Conv/Bus operating mode or ground requests that the crew manually switch to the "2 & 1" or "1 & 3" Conv/Bus operating mode. 2. If relay K3-44 is in the latch position, ground switches to the 1A/3B Conv/Bus operating mode or ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode. Ground requests that the crew open the circuit breaker for Conv #2.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Conv #2/Bus B DCS Cntl Relay #2" (K3-45) (52-79715-11) (Continued)	L M S	a) Pole A fails open when the coil is energized.	a) "Conv #2/Bus B DCS Man Cntl Relay #1 (K3-44) cannot be cycled to the latch position. Power is not applied to Conv #2 when the ground commands a dump of Exp 1 or Exp 2 data. This results in a loss of power to the Experiment Recorders. Experiment Recorder manual commands are not affected.	a) None.	a) The ground does not receive data when a DCS Exp 1 or Exp 2 data dump execute command is given. The Bus Monitor channels (M520, M521 & M522) indicate Bus B is not powered-up and the Tape Motion Monitor channels (K509 & K510) indicate "NO MOTION". Experiment Recorder data is received if crew manually commands the dump.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) Ground switches to the 2A/1B or 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "2 & 1" or "1 & 3" Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole A fails open when the coil is energized.	a) Power is not removed from Conv #2 when the ground removes the Exp 1 or Exp 2 data dump command. The Conv is not damaged by the continuous application of power.	a) None.	a) (1) The following Bus Monitor channels indicate Bus B is continuously powered-up: o +24 VDC Bus B (M520) o -24 VDC Bus B (M521) o + 5 VDC Bus B (M522) (2) The temperature of Conv #2 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) Ground switches to the 1A/3B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the "1 & 3" Conv/Bus operating mode. (3) Ground requests that the crew OPEN to circuit breaker for Conv #2.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv Cntl.Mode Relay #1" (K3-10) (52-79703-61) 3.1.41 This relay is used for manual or DCS control of the Conv/Bus operating mode. Bus A and Bus B +5 VDC power and manual commands to turn on the Bus A and Bus B Conv pass through this relay.	M	a) Pole F fails open in the reset position.	a) (1) Power is not applied to the Prime Data Converter when the crew manually commands a function requiring Prime Data Bus power or the ground gives the DCS Back-up R/T TM "ON" command. (2) Except for the Back-up R/T TM "ON" command, DCS control of Prime Data functions is not affected.	a) If Prime Data Recorder is not operating and the crew manually commands a function requiring the Prime Data Recorder, the "DATA RECORD" light (green) does not come on.	a) There is a loss of Prime TM Data (Real Time and/or Recorded) and/or Voice (from Prime Data Recorder) when the crew manually records or transmits the data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) No effect other than a temporary loss of data. (2) During manned phases, the crew can manually select the desired Conv/Bus operating mode. This eliminates the problem. (3) During unmanned phases, DCS selection of Conv/Bus operating modes can be used as DCS Commands requiring Prime Data Bus power are unaffected by this failure.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (3) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	M	a) Pole E fails open in the rest position.	a) (1) Crew cannot control Experiment Recorder functions. Experiment Recorders Converter will not come ON when crew attempts to record or transmit Experiment Recorder data. (2) There is no effect on DCS Experiment Recorder(s) commands.	a) The STS and OWS "Exp 1" and/or "Exp 2" "RECORD" light(s) (green) do not light up when the crew commands Exp 1 and/or Exp 2 "RECORD".	a) (1) There is a loss of Exp 1 and/or Exp 2 data. (2) Recorded Data 2 (subframe 4 is not affected.	a) N/A	----

(Continued on next sheet)

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv Cntl. Mode Relay #1" (K3-10) (52-79703-61) (Continued)		b) Insulating film on contacts due to contamination.	b) (1) No effect other than a temporary loss of data. (2) The crew can manually select the desired Conv/Bus operating mode. This restores the lost DCS Experiment Recorder(s) command capability.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The STS Exp 1 and Exp 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) (1) Loss of +5 VDC Bus A power. The Conv #1 +5 VDC output voltage increases to approximately 7.5 VDC. No equipment is damaged by this overvoltage.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT", and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) 1. No power readings for those pressure and temperature sensors using +5 VDC power. 2. Bus A +5 VDC Monitor (M13) indicates zero voltage. 3. Questionable data from those signal conditioners requiring +5 VDC power.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data from those transducers requiring +5 VDC power. The PCM System and Transducers can be switched to Bus B power.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) Ground switches to Bus B power for the PCM System and Transducers or requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv. Cntl. Mode Relay #1" (K3-10) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Loss of +5 VDC Bus B power. The Conv #1 +5 VDC output voltage increases to approximately 7.5 VDC. No equipment is damaged by this overvoltage.	a) None.	a) Bus B +5 VDC Monitor (M522) indicates zero voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Bus B +5 VDC power not used for a nominal mission.	b) None.	b) (1) Mission may continue without +5 VDC Bus B power, or (2) Ground may request that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided by Pole B of Relays K3-11 and -12.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None. GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole C or Pole D or Pole E or Pole F fails open in the latch position.	a) None. The latch position is used only in the event of a prior failure which then requires that the manual mode be used for Conv/Bus Selection.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure.	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv. Cntl. Mode Relay #1" (K3-10) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position prior to lift-off and remains in this position for a nominal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires that the manual mode be used for Conv/Bus selection.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv.Cntl.Mode Relay #2" (K3-11) (52-79703-61)	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided on Pole B of Relays K3-10 and K3-12.	a) None.	a) None.	a) N/A	----
3.1.42		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
This relay is used for manual or DCS control of the Conv/Bus operating mode. Bus A and Bus B -24 VDC power passes through this relay.	L M S	a) Pole A fails open in the reset or latch position.	a) None. GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None. Redundancy provided on Pole E of this Relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) None. Redundancy provided on Pole F of this Relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) None. Redundancy provided on Pole C of this Relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv. Cntl. Mode Relay #2" (K3-11) (52-79703-61) (Continued)		a) Pole F fails open in the reset position.	a) None. Redundancy provided on Pole D of this Relay.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole C or Pole D or Pole E or Pole F fails open in the latch position.	a) None. The latch position is used only in the event of a prior failure which then requires that the manual mode be used for Conv/Bus selection.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position prior to lift-off and remains in this position for a nominal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires that the manual mode be used for Conv/Bus selection.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv. Cntl. Mode Relay #3" (K3-12) (52-79703-61) 3.1.43 This relay is used for manual or DCS control of the Conv/Bus operating mode.	L M S	a) Pole F fails open in the reset position.	a) (1) Loss of the +5 V Sensor circuit to Conv #1 (Prime Data Conv.). The +5 VDC output of Conv #1 increases from approximately 7.5 VDC at maximum load to 9 VDC at minimum load. Equipment using +5 VDC power is designed such that it will not be damaged by the overvoltage.	a) The following panel indicators display abnormally high or full scale readings: o The O_2/N_2 bottle pressure, O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK", and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT", and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) (1) Abnormally high or full scale readings for the pressure and temperature sensors using +5 VDC power. (2) Questionable data from those Signal Conditioners requiring +5 VDC power. (3) Bus A +5 VDC Monitor (M513) indicates overvoltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data from those parameters using +5 VDC power. PCM System and Transducers can be switched to Bus B power. This restores lost data.	b) Crew informs ground of the problem.	b) Ground switches to Bus B power for the PCM System and Transducers or requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) (1) Loss of the +5 V Sensor signal to Conv #2 (Experiment Recorder Conv.). The +5 VDC output of Conv #2 increases from approximately 7.5 VDC at maximum load to 9 VDC at minimum load. Overvoltage does not damage any equipment.	a) None.	a) Bus B +5 VDC Monitor (M522) indicates overvoltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Bus B +5 VDC power is not used during a nominal mission. Mission can continue with the overvoltage or crew can eliminate problem by manually selecting Conv/Bus operating mode.	b) None.	b) Ground may request that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv. Cntl. Mode Relay #3" (K3-12) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) (1) Ground cannot command Experiment Recorder functions. Experiment Recorders Conv will not come ON for DCS Experiment Recorder commands. (2) Manual control of Experiment Recorders is not affected.	a) None.	a) (1) Data is not received when ground commands a Dump Execute from Experiment 1 and/or Experiment 2 Recorder. (2) The following Bus Monitor channels indicate zero voltage when ground commands Dump Execute from the Experiment Recorders: o +24 VDC Bus B (M520) o -24 VDC Bus B (M521) o - 5 VDC Bus B (M522)	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew can manually control the dumping of data from the Experiment Recorders or ground control of the Experiment Recorders can be restored by using manual selection of the Conv/Bus operating mode.	b) None.	b) (1) Ground requests that the crew manually dump the Experiment Recorder(s) Data, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) (1) Except for the Back-up R/T TM "ON" DCS command, there is a loss of DCS capability to control the Prime Data functions.	a) None.	a) (1) The ground does not receive data when the following DCS commands are made: o R/T TM - ON o Data Recorder Dump, Execute - Dump. (2) Ground receives data if Back-up R/T TM-ON DCS command is made.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) None. During manned phases, crew can manually select the Conv/Bus operating mode. This eliminates the problem. (2) During unmanned phases, ground can receive R/T TM via the DCS Back-up R/T TM command. Ground cannot receive Delayed Prime Data.	b) None.	b) (1) Ground requests that the crew manually select the Conv/Bus operating mode. (2) During unmanned phases the ground can use the DCS Back-up R/T TM command to obtain R/T data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Conv. Cntl.Mode Relay #3" (K3-12) (52-79703-61) (Continued)	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided on Pole B of Relays K3-10 and K3-11.	a) None.	a) None.	a) I/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole C or Pole D or Pole E or Pole F fails open in the latch position.	a) None. The latch position is used only in the event of a prior failure which then requires that the manual mode be used for Conv/Bus selection.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position prior to lift-off and remains in this position for a normal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires the manual mode be used for Conv/Bus selection.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv Sel Relay #1" (K3-14) (52-79703-61) 3.1.45 This relay is used for DCS selection of Conv/Bus operating mode.	L M S	a) Pole D fails open in the reset position.	a) Loss of +5 VDC Bus B power.	a) None.	a) Bus B +5 VDC Monitor (M522) indicates zero voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Bus B +5 VDC power not used for a nominal mission. Crew or ground can perform switching necessary to restore +5 VDC Bus B power.	b) None.	b) (1) Ground can switch to the 1A/3B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) Ground cannot command Experiment Recorder functions. Experiment Recorders Conv will not come ON for DCS Experiment Recorder commands.	a) None.	a) (1) Data is not received when ground commands a Dump Execute from Experiment 1 and/or Experiment 2 recdr. (2) The following Bus Monitor channels indicate zero voltage when ground commands Dump Execute from the Experiment Recorders: o +24 VDC Bus B (M520) o -24 VDC Bus B (M521) o + 5 VDC Bus B (M522)	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching necessary to restore lost DCS Experiment Recorder control capability.	b) None.	b) (1) Ground can switch to the 1A/3B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the designed Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None. GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv.Sel. Relay #1" (K3-14) (52-79703-61) (Continued)	L M S	a) Pole C or Pole E or Pole F fails open in the reset position.	a) None. The reset position for these poles is needed only in the event of a prior failure which then requires DCS selection of the 3A/2B Conv/ Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Pole B or Pole D fails open in the latch position.	a) None. The latch position for these poles is needed only in the event of a prior failure which then requires DCS selection of the 1A/3B Conv/ Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Pole C or Pole E or Pole F fails open in the latch position.	a) None. The latch position for these poles is needed only in the event of a prior failure which then requires DCS selection of the 2A/1B Conv/ Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #1" (K3-14) (52-79703-61)	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position prior to lift-off and remains in this position during a nominal mission.	a) None.	a) None.	a) N/A	----
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires DCS selection of the 1A/3B or 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #2" (K3-15) (52-79703-61) 3.1.46 This relay is used for DCS selection of Conv/Bus operating mode.	L M S	a) Pole L fails open in the reset position.	a) Loss of -24 VDC Bus B power.	a) None.	a) The -24 VDC Bus B Monitor (M521) indicates zero voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Bus B -24 VDC power is not needed during a nominal mission. Crew or ground can perform switching necessary to restore -24 VDC Bus B power.	b) None.	b) (1) Ground can switch to the 1A/3B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	M	a) Pole B fails open in the reset position.	a) (1) Crew cannot control Experiment Recorder(s) functions. Experiment Recorders Converter will not come ON when crew attempts to record or transmit Experiment Recorder data. (2) There is no effect on DCS Experiment Recorder(s) commands.	a) The STS and OWS "EXP 1" and/or "EXP 2 RECORD" light(s) (green) do not light up when the crew commands Exp 1 and/or Exp 2 "RECORD".	a) (1) There is a loss of Exp 1 and/or Exp 2 data. (2) Recorded Data 2 (subframe 4) is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of Experiment Recorder(s) data. Crew or ground can restore Experiment Recorder(s) manual control capability.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The STS Exp 1 & Exp 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground selects the 1A/3B or 2A/1B, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #2" (K3-15) (52-79703-61) (Continued)	L M S	a) Pole C or Pole E or Pole F fails open in the reset position.	a) None. The reset position for these poles is needed only in the event of a prior failure which then requires DCS selection of the 3A/2B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Pole C or Pole E or Pole F fails open in the latch position.	a) None. The latch position for these poles is needed only in the event of a prior failure which then requires DCS selection of the 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position prior to lift-off and remains in this position during a nominal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires DCS selection of the 1A/3B or 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #2" (K3-15) (52-79703-61) (Continued)	L M S	a) Pole B or Pole D fails open in the latch position.	a) None. The latch position for these poles is needed only in the event of a prior failure which then requires DCS selection of the 1A/3B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCA Conv. Sel. Relay #3" (K3-16) (52-79703-61) 3.1.47 This relay is used for DCS selection of the Conv/Bus operating mode.	L M S	a) Pole D fails open in the reset position.	a) Loss of the +5 V Sensor signal to Conv #2 (Experiment Recorder Conv). The +5 VDC output of Conv #2 increases to from approximately 7.5 VDC at maximum load to 9 VDC at minimum load. Overvoltage does not damage any equipment.	a) None.	a) Bus B +5 VDC Monitor (M522) indicates overvoltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Bus B +5 VDC power is not used during a nominal mission. Crew or ground can perform the switching necessary to restore the +5 V Sensor signal.	b) None.	b) (1) Ground selects the 1A/3B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually switch to the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A----	
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B or Pole C or Pole E or Pole F fail open in the reset position.	a) None. The reset position for these poles is needed only in the event of a prior failure which requires DCS selection of the 3A/2B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #3" (K3-16) (52-79703-61)	L M S	a) Pole B or Pole C or Pole E or Pole F fail open in the latch position.	a) None. The latch position for these poles is needed only in the event of a prior failure which then requires DCS selection of the 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Pole D fails open in the latch position.	a) None. The latch position for this pole is needed only in the event of a prior failure which then requires DCS selection of the 1A/3B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position prior to lift-off and remains in this position during a nominal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires DCS selection of the 1A/3B or 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
elay, Latching, DCS Conv. Sel. elay #4" K3-17) 52-79703-61) 3.1.48 This relay is used for DCS selection of Conv/Bus operating mode.	L M S	a) Pole F fails open in the reset position.	a) Loss of +5 VDC Bus A power. The Conv #1 +5 VDC output voltage increases to approximately 7.5 VDC. No equipment is damaged by this overvoltage.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, O_2/N_2 pressure (200/225 PSI) and the "FWL", "LOCK" and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT", and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) (1) No power readings for those pressure and temperature-sensors using +5 VDC power. (2) Bus A +5 VDC Monitor (M613) indicates zero voltage. (3) Questionable data from those Signal Conditioners requiring +5 VDC power.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data from those transducers requiring +5 VDC power. Loss of power can be restored by the crew or the ground.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Loss of +5 VDC Bus B Power. The Conv #2 +5 VDC output voltage increases to approximately 7.5 VDC. No equipment is damaged by this overvoltage.	a) None.	a) Bus B +5 VDC Monitor (M522) indicates zero voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Bus B +5 VDC power not used for a nominal mission.	b) None.	b) (1) Mission may continue without +5 VDC Bus B power, or (2) Ground switches to the 3A/2B or 2A/1B Conv/Bus operating mode, or (3) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #4" (K3-17) (52-79703-61)	L M S	a) Pole D fails open in the reset position.	a) Loss of -24 VDC Bus A power. This results in a loss of power to the PCM System.	a) Questionable readings on the "$PPCO_2$ IN" (located on the STS Molecular Sieve Panel, Panel 203).	a) Loss of all TM data.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None, other than a temporary loss of TM data. Ground or crew can restore lost power.	b) Crew informs ground of the problem.	b) (1) Ground switches to the 3A/2B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Loss of -24 VDC Bus B power.	a) None.	a) The -24 VDC Bus B Monitor (M521) indicates zero voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Bus B -24 VDC power is not needed during a nominal mission.	b) None.	b) (1) Mission may continue without -24 VDC Bus B power, or (2) Ground switches to the 3A/2B or 2A/1B Conv/Bus operating mode, or (3) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #4" (KJ-17) (52-79703-61) (Continued)	L M S	a) Pole B fails open in the reset position.	a) (1) Ground cannot command Experiment Recorder functions. Experiment Recorders Conv will not come ON for DCS Experiment Recorder commands. (2) Manual control of Experiment Recorders is not affected.	a) None.	a) (1) Data is not received when ground commands a Dump Execute from Experiment 1 and/or Experiment 2 Recorder. (2) The following Bus Monitor channels indicate zero voltage when ground commands Dump Execute from the Experiment Recorders: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 + 5 VDC Bus B (M522)	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew can manually control the dumping of data from the Experiment Recorders or ground control of the Experiment Recorders can be restored by using manual selection of the Conv/Bus operating mode.	b) None.	b) (1) Ground switches to the 3A/2B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole F or Pole E or Pole D or Pole C or Pole B fail open in the latch position.	a) None. The latch position is used only in the event of a prior failure which then requires DCS selection of the 3A/2B or 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #4" (K3-17) (52-79703-61)	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position prior to lift-off and remains in this position during a nominal mission.	a) None.	a) None.	a) N/A	----
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires DCS selection of the 3A/2B or 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #5" (K3-18) (52-79703-61) 3.1.49 This relay is used for DCS selection of Conv/Bus operating modes.	L M S	a) Pole F fails open in the reset position.	a) (1) Loss of the +5 V Sensor circuit to Conv #1 (Prime Data Conv). The +5 VDC output of Conv #1 increases to from approximately 7.5 VDC at maximum load to 9 VDC at minimum load. Equipment using +5 VDC power is designed such that it will not be damaged by the overvoltage.	a) The following panel indicators display abnormally high or full scale readings: o The O_2/N_2 bottle pressure, O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) (1) Abnormally high or full scale readings for the pressure and temperature sensors using the +5 VDC power. (2) Questionable data from those Signal Conditioners requiring +5 VDC power. (3) Bus A +5 VDC Monitor (M513) indicates overvoltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can restore the +5V Sensor circuit for the Prime Data Converter.	b) (1) Crew informs the ground of the anomaly.	b) (1) Ground switches to the 3A/2B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) (1) Loss of the +5 V Sensor signal to Conv #2 (Experiment Recorder Conv). The +5 VDC output of Conv #2 increases to from approximately 7.5 VDC at maximum load to 9 VDC at minimum load. Overvoltage does not damage any equipment.	a) None.	a) Bus B +5 VDC Monitor (M522) indicates overvoltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can restore the +5 V Sensor circuit for the Experiment Recorder Converter.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay # 5" (K3-18) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) Except for the Back-up R/T TM "ON" DCS command, there is a loss of DCS capability to control the Prime Data functions.	a) None.	a) (1) The ground does not receive data when the following DCS commands are made: o R/T TM - ON o Data Recorder Dump, Execute - Dump (2) Ground received data if Back-up R/T TM - ON DCS command is made.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can correct the problem.	b) None.	b)(1) Ground switches to the 3A/2B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) (1) Power is not applied to the Prime Data Converter when the crew manually commands a function requiring Prime Data bus power or the ground gives the DCS Back-up R/T TM "ON" command. (2) Except for the Back-up R/T TM "ON" command, DCS control of Prime Data functions is not affected.	a) When the crew switches the DATA record switch (located on Panel 204) to the "RECORD" position, the "RECORD" light (green) does not come on.	a) There is a loss of Prime TM Data (Real Time and/or Recorded) and/or Voice (from Prime Data Recorder) when the crew manually records or transmits the data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform the switching necessary to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs the ground of the anomaly.	b) (1) Ground switches to the 3A/2B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #5" (K3-18) (52-79703-61) (Continued)	M	a) Pole B fails open in the reset position.	a) (1) Crew cannot control Experiment Recorder functions. Experiment Recorders Converter will not come ON when crew attempts to record or transmit Experiment Recorder data. (2) There is no effect on DCS Experiment Recorder(s) commands.	a) The STS and OWS "EXP 1" and/or "EXP 2 RECORD" light(s) (green) do not light up when the crew commands Exp 1 and/or Exp 2 "RECORD".	a) (1) There is a loss of Exp 1 and/or Exp 2 data. (2) Recorded Data 2 (subframe 4) is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) No effect other than a temporary loss of Experiment Recorder Data. Crew or ground can correct the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The STS Exp 1 & Exp 2 "RECORD" lights test good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) (1) Ground switches to the 3A/2B or 2A/1B Conv/Bus operating mode, or (2) Ground requests that the crew manually select the desired Conv/Bus operating mode.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole F or Pole E or Pole D or Pole C or Pole B fail open in the latch position.	a) None. The latch position is used only in the event of a prior failure which then requires DCS selection of the 3A/2B or 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a)N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Conv. Sel. Relay #5" (K3-18) (52-79703-61)	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position prior to lift-off and remains in this position during a normal mission.	a)None.	a)None.	a) N/A	----
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b)None.	b)None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires DCS selection of the 3A/2B or 2A/1B Conv/Bus operating mode.	a) None.	a)None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b)None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) NDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Converter Select Relay #6" (K3-334) (52-79703-53) 3.1.53 This relay is used for DCS selection of Conv/Bus operating mode.	L M S	a) Pole A fails open in the latch or reset position.	a) No effect - used for GSE only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) No effect- Pole B is a spare.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None. Redundancy provided on Pole D of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contact due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) None. Redundancy provided on Pole C of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contact due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) None. Redundancy provided on Pole F of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

DATE 31 August 1971
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SYSTEM: INSTRUMENTATION
SUBSYSTEM: CONVERTER CONTROL

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Converter Select Relay #6" (K3-334) (52-79703-53) (Continued)	L M S	a) Pole F fails open in the reset position.	a) None. Redundancy provided on Pole E of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. This relay is in the reset position at lift-off and remains in this position for a normal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which requires that the ground select the 1A/3B or 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Pole C or Pole D or Pole E or Pole F fail open in the latch position.	a) None. The latch position is needed only in the event of a prior failure which requires that the ground select the 1A/3B or 2A/1B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
"DCS Converter Select Relay #8" (K3-336) (52-79703-53) 3.1.55 This relay is used for DCS selection of Conv/Bus operating mode.	L M S	a) Pole A fails open in the latch or reset position.	a) No effect - used for GSE only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) No effect - Pole B is a spare.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None. Redundancy provided on Pole D of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) None. Redundancy provided on Pole C of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) None. Redundancy provided on Pole F of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
"DCS Converter Select Relay #8" (K3-336) (52-79703-53) (Continued)	L M S	a) Pole F fails open in the reset position.	a) None. Redundancy provided on Pole E of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. This relay is in the reset position at lift-off and remains in this position for a normal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which requires that the ground select the 1A/3B or 3A/2B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Pole C or Pole D or Pole E or Pole F fail open in the latch position.	a) None. The latch position is used only in the event of a prior failure which requires that the ground select the 1A/3B or 3A/2B Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Converter Control Mode Relay #5" (K3-337) (52-79703-53) 3.1.56 This relay is used for manual or DCS selection of Conv/Bus operating mode. Bus A and Bus B +24 VDC power passes through this relay.	L M S	a) Pole A fails open in the reset or latch position.	a) No effect - used for GSE only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the latch or reset position.	a) None. Redundancy provided on Relays K3-10, K3-11 and K3-12.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None. Redundancy provided on Pole D of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) None. Redundancy provided on Pole C of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) None. Redundancy provided on Pole F of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Converter Control Mode Relay # 5" (K3-337) (52-79703-53) (Continued)	L M S	a) Pole F fails open in the reset position.	a) None. Redundancy provided on Pole E of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. This relay is in the reset position at lift-off and remains in this position for a normal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which requires that the crew manually select the Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	M	a) Pole C or Pole D or Pole E or Pole F fails open in the latch position.	a) None. The latch position is used only in the event of a prior failure which requires that the crew select the crew select the Conv/Bus operating mode.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #8" (K3-310) (52-79703-61) 3.1.57 This relay is used for selecting Bus A or Bus B for PCM System power. The relay is controlled by DCS commands.	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) Power is not removed from the Prime Data Conv (Conv #1) when the ground commands that the Prime Data Conv be powered-down.	a) None.	a) None, except that the temperature of the Prime Data Conv may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The equipment is designed to withstand the continuous application of power. Ground can perform switching required to circumvent the problem.	b) None.	b) Ground switches to Bus B power for Prime Data equipment and Bus A power for the Experiment Recorders. This corrects the problem.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) Power is not removed from the Experiment Recorder Conv (Conv #2) when the ground commands that the Experiment Recorder Conv be powered-down.	a) None.	a) (1) The following Bus Monitor channels indicate Bus B is powered-up even though the Experiment Recorders are powered-down: o +24 VDC Bus B (M520) o -24 VDC Bus B (M521) o + 5 VDC Bus B (M522) (2) Temperature of Conv #2 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None.	b) (1) Ground switches to Bus B power for Prime Data equipment and Bus A power for the Experiment Recorders. This corrects the problem.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay # 8" (K3-310) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Power is not applied to the Prime Data Conv (Conv # 1) when the ground commands a function requiring Bus A power. This results in a loss of power to the PCM System.	a) None.	a) (1) Data is not received when the ground gives the command (via DCS) to: o Transmit R/T TM. o Dump data or data a voice from the Prime Data Recorder. (2) Data is received if ground uses the Back-up R/T TM command.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None.	b) Ground switches to Bus B power for Prime Data equipment and Bus A power for the Experiment Recorders.	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) Power is not applied to the Experiment Recorder Conv (Conv # 2) when the ground commands a function requiring the Experiment Recorders. This results in a loss of power to the Experiment Recorders.	a) None.	a) (1) Data is not received from the Exp 1 and/or Exp 2 Recorder(s) when the ground commands a dump from one or both of these recorders. (2) The following Bus Monitor channels indicate zero voltage when the ground commands an Experiment Recorder dump: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 + 5 VDC Bus B (M522)	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None.	b) Ground switches to Bus B power for Prime Data equipment and Bus A power for the Experiment Recorders.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
ay, Latching, CM Bus Select lay # 9" 3-311) 2-79703-61) 3.1.58	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a)None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
is relay is ed for select- g Bus A or s B for PCM stem power. e relay is ntrolled by S commands.	L M S	a) Pole B fails open in the reset position.	a) Power is not removed from the Prime Data Conv (Conv #1) when the crew commands that the Prime Data Conv be powered-down.	a) None.	a) None, except that the temperature of the Prime Data Conv may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The equipment is designed to withstand the continuous application of power. Ground can perform switching required to circumvent the problem.	b) None.	b) Ground switches to Bus B power for Prime Data equipment and Bus A power for the Experiment Recorders. This corrects the problem.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) Power is not removed from the Experiment Recorder Conv (Conv #2) when the crew commands that the Experiment Recorder Conv be powered-down.	a) None.	a) (1) The following Bus Monitor channels indicate Bus B is powered-up even though the Experiment Recorders are powered-down: o +24 VDC Bus B (M520) o -24 VDC Bus B (M521) o -5 VDC Bus B (M522) (2) The temperature of Conv #2 may be higher than expected after periods when the Conv was supposed to have been powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None.	b) (1) Ground switches to Bus B power for Prime Data equipment and Bus A power for the Experiment Recorders. This corrects the problem.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay # 9" (K3-311) (52-79703-61) (Continued)	M	a) Pole C fails open in the reset position.	a) Power is not applied to the Prime Data Conv (Conv #1) when the crew commands a function requiring Bus A power. This results in a loss of power to the PCM System. DCS commands are not affected.	a) When the crew switches the "DATA" record switch (located on Panel 204) to the "RECORD" position, the "RECORD" light (green) does not come on.	a) There is a loss of Prime TM Data (Real Time and/or Recorded) and/or Voice (from Prime Data Recorder) when the crew manually records or transmits the data.	a) N/A	----
		b) Insulating film on contacts due to contamination	b) None. Ground can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "RECORD" light tests good. (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.	b) Ground switches to Bus B power for Prime Data equipment and Bus A power for the Experiment Recorders.	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) Power is not applied to the Experiment Recorder Conv (Conv #2) when the crew commands a function requiring the Experiment Recorders. This results in a loss of power to the Experiment Recorders.	a) When the crew switches an Exp 1 or Exp 2 switch to the "RECORD" position, the respective STS and OWS Experiment Record Lights (green) do not light up.	a) (1) Data is not received from the Exp 1 and/or Exp 2 Recorder(s) when the ground commands a dump from one or both of these recorders. (2) The followng Bus Monitor channels indicate zero voltage when the ground commands an Experiment Recorder dump: 0 +24 VDC Bus B (M520) 0 -24 VDC Bus B (M521) 0 -5 VDC Bus B (M522)	a) N/A	----
		b) Insulating film on contacts due to contamination	b) None. Ground can perform switching to circumvent the problem.	b) (1) Crew positions the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The AM Exp 1 & Exp 2 "RECORD" lights test good. (Continued next page)	b) Ground switches to Bus B power for Prime Data equipment and Bus A power for the Experiment Recorders.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay # 9" (K3-311) (52-79703-61) (Continued)				b) (Continued) (2) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (3) Crew informs ground of the anomaly.			
	M	a) Pole F fails open in the reset position.	a) The Display Converter does not receive power when Bus A is powered-down. This results in a loss of power to certain panel indicator-sensors when Bus A is powered-down.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCR" and "$PPCO_2$ IN" indicators (located on the Molecular Sieve Panel, Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK", and "AFT" pressure indicators (located on the O_2/N_2 Control System Panel, Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on the Condensate Control Panel, Panel 216). o The "LOCK", "AFT", and "O_2" pressure indicators (located on the Lock Compartment Instrument Panel, Panel 316).	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly.	b) Ground switches to Bus B power for the Prime Data equipment and Bus A power for the Experiment Recorders.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay # 9" (K3-311) (52-79703-61) (Continued)	M	a) Pole B or Pole C or Pole D or Pole E or Pole F fail open in the latch position.	a) None. The latch position is used only in the event of a prior failure which requires that Bus B power must be used for Prime Data equipment and Bus A power be used for Experiment Recorders.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position at lift-off and remains in this position during normal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires that Bus B power be used for Prime Data equipment and Bus A power be used for the Experiment Recorders.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Group #1 Bus Select Relay" (K3-312) (52-79703-61) 3.1.59 This relay used for selecting Bus A or Bus B power for Transducer Group #1. Bus A Power will be used for a nominal mission.	L M S	a) Pole E or Pole F fail open in the reset or latch position.	a) None. These are spare poles.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) No effect - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) There is a loss of Group 1 Transducers +24 VDC power.	a) None.	a) (1) Ground observes a loss of TM data from those Group 1 Transducers requiring +24 VDC power. (2) Ground observes questionable data for those Instrumentation Package 2A parameters which require +24 VDC power. (3) Bus A +24 VDC Monitor (M611) indicates nominal voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data for those TM parameters dependent on Group 1 +24 VDC power. The Transducers, Signal Conditioners and PCM System can be powered from Bus B.	b) None.	b) Ground switches the PCM System and Transducers to Bus B power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Group # 1 Bus Select Relay" (K3-312) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) There is a loss of Group 1 Transducers -24 VDC power.	a) None.	a) (1) Ground observes a loss of TM data from those Group 1 Transducers requiring -24 VDC power. (2) Ground observes questionable data for those Instrumentation Package 2A parameters which require -24 VDC power. (3) Bus A -24 VDC Monitor (M512) indicates nominal voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data for those TM parameters dependent on Group 1 -24 VDC power. The Transducers, Signal Conditioners and PCM System can be powered from Bus B.	b) None.	b) Ground switches the PCM System and Transducers to Bus B power.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) There is a loss of Group 1 Transducers +5 VDC power.	a) None.	a) (1) Ground observes a loss of TM data from those Group 1 Transducers requiring +5 VDC power. (2) Ground observes questionable data for those Instrumentation Package 2A parameters which require +5 VDC power. (3) Bus A +5 VDC Monitor (M513) indicates nominal voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data for those TM parameters dependent on Group 1 +5 VDC power. The Transducers and Signal Conditioners and PCM System can be powered from Bus B.	b) None.	b) Ground switches the PCM System and Transducers to Bus B power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Group # 1 Bus Select Relay" (K3-312) (52-79703-61)	L M S	a) Pole B or Pole C of Pole D fail open in the latch position.	a) None. These poles are needed only in the event of a prior failure which then requires that Bus B power be used for the Group 1 Transducers.	a) None.	a) None.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure.	
	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position at lift-off and remains in this position for a nominal mission.	a) None.	a)None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires that Bus B power be used for the Group 1 Transducers.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Group #2 Bus Select Relay" (K3-313) (52-79703-61) 3.1.60 This relay used for selecting Bus A or Bus B power for Transducer Group #2. Bus A power will be used for a nominal mission.	L M S	a) Pole E or Pole F fail open in the reset or latch position.	a) None. These are spare poles.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) No effect - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) There is a loss of Group 2 Transducers +24 VDC power.	a) None.	a) (1) Ground observes a loss of TM data from those Group 2 Transducers requiring +24 VDC power. (2) Ground observes questionable data for those Instrumentation Package 2B parameters which require +24 VDC power. (3) Bus A +24 VDC Monitor (M511) indicates nominal voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data for those TM parameters dependent on Group 2 +24 VDC power. The Transducers, Signal Conditioners and PCM System can be powered from Bus B.	b) None.	b) Ground switches the PCM System and Transducers to Bus B power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Group #2 Bus Select Relay" (K3-313) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) There is a loss of Group 2 Transducers -24 VDC power.	a) None.	a) (1) Ground observes a loss of TM data from those Group 2 Transducers requiring -24 VDC power. (2) Ground observes questionable data for those Instrumentation Package 2B parameters which require -24 VDC power. (3) Bus A -24 VDC Monitor (M512) indicates nominal voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data for those TM parameters dependent on Group 2 -24 VDC power. The Transducers, Signal Conditioners and PCM System can be powered from Bus B.	b) None.	b) Ground switches the PCM System and Transducers to Bus B power.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) There is a loss of Group 2 Transducers +5 VDC power.	a) None.	a) (1) Ground observes a loss of TM data from those Group 2 Transducers requiring +5 VDC power. (2) Ground observes questionable data for those Instrumentation Package 2B parameters which require +5 VDC power. (3) Bus A +5 VDC Monitor (M513) indicates nominal voltage.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data for those TM parameters dependent on Group 2 +5 VDC power. The Transducers, Signal Conditioners and PCM System can be powered from Bus B.	b) None.	b) Ground switches the PCM System and Transducers to Bus B power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Group 2 Bus Select Relay" (K3-313) (52-79703-61)	L M S	a) Pole B or Pole C or Pole D fails open in the latch position.	a) None. These poles are needed only in the event of a prior failure which then requires that Bus B power be used for the Group 2 Transducers.	a) None.	a) None.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A Double Failure	
	L M S	a) Reset coil fails open.	a) None. The relay is in the reset position at lift-off and remains in this position for a nominal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) None. The latch coil is needed only in the event of a prior failure which then requires that Bus B power be used for the Group 2 Transducers.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) N/A Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Resistor, Metal Film, "RNC65E5001-BP-AM" (Any 1 of 6) 3.1.65 3.1.66 3.1.67 3.1.68 3.1.69 3.1.70 These resistors are used for isolating the Bus A and Bus B voltage monitor Signal Conditioner cards from the buses.	L M S	a) Resistor fails open.	a) Loss of power to Signal Conditioner for respective Bus A or Bus B voltage monitor on TM. This results in a loss of one of the following TM channels: M511, M512, M513, M520, M521 or M522.	a) None.	a) Ground observes zero voltage indication on respective Bus A or Bus B voltage monitor channel.	a) N/A	----
		b) Excessive mechanical or thermal stress.	b) None. Data not essential for mission completion.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker Magnetic, "INSTRUMENTATION SYSTEM TRANSMITTERS A" (3-2) (52-79721-322) (3.9 amps)	L	a) Opens before normal break current is exceeded.	a) Loss of power to TM transmitter A, both the 2-watt transmitter and the 10-watt transmitter which is used after the corona region is passed.	a) None	a) Loss of carrier wave from transmitter A.	a) N/A	---
3.2.1 (Located on Panel 200)		b) Internal defect, coil short to ground.	b) There will be a loss of some telemetered data. After passing through the corona region, the 10-watt Xmtrs B and C can be used for data transmission.	b) None	b) (1) Ground switches to transmitter B or C for R/T TM data. (2) Ground revises TM transmitter data assignments to allow for loss of one transmitter.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker Magnetic, "INSTRUMENTATION SYSTEM TRANSMITTERS A" (3-2) (52-79721-322) (3.9 amps) 3.2.1 or "INSTRUMENTATION SYSTEM TRANSMITTERS B" (3-3) (52-79721-322) (3.9 amps) 3.2.2 or "INSTRUMENTATION SYSTEM TRANSMITTERS C" (3-46) (52-79721-322) (3.9 amps) 3.2.3 (Any 1 of 3) (These circuit breakers are located on Panel 200)	L M S	a) One of these breakers opens before normal break current is exceeded. b) Internal defect, coil short to ground.	a) Loss of power to respective TM transmitter. b) There is a degradation of data coverage since only two frequencies will be available for data transmission.	a) Circuit breaker bat handle is in the open position. b) (1) Crew attempts to reset affected circuit breaker. (2) Crew informs ground of anomaly.	a) Loss of carrier wave from respective TM transmitter. b) (1) Ground request that the crew check the associated switches and circuit breakers. (2) Ground revises TM transmitter data assignments to allow for loss of one transmitter.	a) N/A b) IIIb	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "CONTROL TELEMETRY MAN" (3-60) (52-79721-322) (3.9 amps) 3.2.4.	L M S	a) Opens before normal break current is exceeded.	a) (1) Loss of power for manual control of TM transmitters. This has no effect during a normal mission as the TM transmitters are normally DCS controlled. (2) Loss of power for switching the PCM Bus Select Relays. These relays are not switched during a normal mission. (3) Loss of power for control of the conv #1/#2/#3 Bus A/ Bus B Man Cntl Relays. Power is not applied to the conv(s) when the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position or the ground commands Data 2 RECORD (S330).	a) (1) The circuit breaker bat handle is in the open position. (2) When crew switches the "DATA" switch to the "RECORD" position, the "RECORD" light does not come ON.	a) Loss of recorded Data 2 (subframe 4).	a) N/A	---
		b) Internal defect, coil shorts to ground.	b) (1) During unmanned phases, there is a loss of recorded Data 2 (subframe 4) data. R/T subframe 4 data is not affected.	b) (1) Crew attempts to reset the circuit breaker. (2) Crew switches a Voice Record switch to the "RECORD" position. Data "RECORD" and voice "RECORD" lights come ON. (3) Crew notifies ground of anomaly.	b) (1) Ground requests that the crew check associated switches and circuit breakers. (2) When ground wishes to record Data 2 (subframe 3) they request that the crew switch an Exp 1 switch to the "RECORD" position. This provides power for recording Data 2 (subframe 4).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW c) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker Magnetic, "CONTROL TELEMETRY CMD" (3-10) (52-79721-322) (3.9 amps) 3.2.5	L M S	a) Opens before normal break current is exceeded.	a) (1) Loss of power for carrying out the following DCS ON/OFF commands: o Data Dump Enable (6-1) o Exp 2 Dump Enable (12-2) o R/T TM (11-2) o Exp 1 & Exp Voice Dump Enable (10-2) o Data & Voice Dump Enable (16-2) (2) Loss of power for DCS control, control of Conv/Bus selection. (3) Loss of power for control of conv #1/#2/#3 Bus A/Bus B DCS cntl relays. (4) Loss of power for control of PCM Power CMD Control Relays.	a) The circuit breaker bat handle is in the open position.	a) (1) Ground observes that the DCS R/T TM ON/OFF and Redr dump enable (and Execute) ON/OFF commands are not being carried out.	a) N/A	---
		b) Internal defect, coil short to ground.	b) Loss of DCS control of the recorders results in loss of recorded data during unmanned phases. R/T TM is available via the Backup R/T TM commands (S269/S268).	b) (1) Crew attempts to reset the circuit breaker. (2) Crew informs ground of the anomaly.	b) (1) Ground uses the Backup R/T TM ON command (S268). R/T TM is received. (2) Ground requests that the crew manually control the recording and dumping of spacecraft and experiment data. (3) If the conv/Bus configuration must be changed, ground requests that the crew make the change.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "TRANSMITTERS" (52-79705-21) (Located on Panel 204) 3.2.6	L M S	a) Contact set (11, 10) fails open in the "CMD" position.	a) (1) Loss of power for control of the PCM Power Manual Control Relays. These relays are used for controlling power for the MDA and OWS-1 & -2 Signal Conditioners. (2) Power for controlling the PCM Power CMD Control Relays is not affected.	a) None.	a) If relays are in the reset position, ground observes a loss of recorded subframe 1 MDA and OWS-1 & -2 Signal Conditioner data if the crew has manually recorded subframe 1. If ground uses Backup R/T TM ON command (S268), data is not received from the MDA & OWS-1 & -2 Signal Conditioner.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) If failure occurs when the PCM Power Manual Control Relays are in latch position, power is continuously applied to the affected signal conditioners.	b) None.	b) (1) When ground records Data 2 (subframe 4), they also record Prime Data (subframe 1). This restores power to the affected signal conditioners. (2) Ground requests that the crew use a Voice Record switch when they record Prime Data. This restores power to the affected signal conditioners.	b) IIIb	
	L M S	a) Contact set (8,7 or 5,4 or 2,1) fails open in the "CMD" position.	a) None. Switch is in the "CMD" position at lift-off and is expected to remain in this position for a normal mission. These contact sets serve no function as long as the switch remains in the "CMD" position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "TRANSMITTERS" (52-79705-21) (Located on Panel 204) 3.2.6 (Continued)	M	a) Contact set (11,10 or 8,9 or 5,6 or 2,1) fails open in the "OFF" position.	a) None. Switch is in "CMD" position at lift-off and is expected to remain in this position for a normal mission.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Contact set (2,3 or 5,6 or 8,9 or 11,12) fails open in the "ON" position.	a) None. Switch is in the "CMD" position at lift-off and is expected to remain in this position for a normal mission.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Manual Control Relay #10" (K3-256) (52-79703-61) 3.2.17 or Relay, Latching, "Xmtr B Manual Control Relay #10" (K3-257) (52-79703-61)	M	a) Pole C fails open in the reset position.	a) Power is applied to the Exp 2 Rcdr whenever the Exp Rcdr Conv is powered-up, e.g., when Exp 1 data is being recorded or dumped, the Exp 2 Rcdr will be powered-up.	a) If the Exp 2 Rcdr reaches the end-of-tape, the Exp 2 Rcdr "STOP" light (on Panel 204) comes ON.	a) The Exp 2 Rcdr Tape Motion Monitor channel (normally K510) indicates tape motion whenever the Exp Rcdr Conv is powered-up, that is, provided the end-of-tape has not been reached.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The crew can manually remove power from the Exp 2 Rcdr.	b) (1) Crew informs ground of observed anomaly. (2) Crew switches Tape Rcdrs to the manual mode and removes power from the Exp 2 Rcdr.	b) (1) Ground requests that the crew manually control the Tape Rcdrs.	b) IIIb	
or 3.2.27 or Relay, Latching, "Xmtr C Manual Control Relay #10" (K3-258) (52-79703-61)	M	a) Pole C or Pole D or Pole E or Pole F or Pole B fails open in the latch position.	a) None. This relay is in the reset position at lift-off and is expected to remain in this position during a normal mission. The latch position is used for certain manually controlled Transmitter functions.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
3.2.37	L M S	a) Pole B or Pole D or Pole E or Pole F fails open in the reset position.	a) None. These poles are functional in this position only if the Transmitters are being manually controlled. During a normal mission the Transmitters are controlled by the Ground.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.		b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Manual Control Relay #10" (K3-256) (52-79703-61) (Continued)	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
or Relay, Latching, "Xmtr B Manual Control Relay #10" (K3-257) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) None. The relay is in the reset position at lift-off and is expected to remain in this position for a normal mission.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
or Relay, Latching "Xmtr C Manual Control Relay #10" (K3-258) (52-79703-61) (Continued)	M	a) Latch coil fails open.	a) Respective Transmitter cannot be manually configured for transmission of recorded Data, Voice or Exp 2 data.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. During a normal mission, the ground controls the TM Transmitters, thus the latch position is not used during a normal mission.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Manual Control Relay #2" (K3-95) (52-79703-53) 3.2.18 or Relay, Latching, "Xmtr B Manual Control Relay #2" (K3-234) (52-79703-53) 3.2.28 or Relay, Latching, "Xmtr C Manual Control Relay #2" (K3-243) (52-79703-53) 3.2.38	M	a) Pole E fails open in the reset position.	a) Power is applied to the Exp 1 Rcdr whenever the Exp Rcdr Conv is powered-up.	a) If the Exp 1 Rcdr reaches the end-of-tape, the Exp 1 Rcdr "STOP" light (on Panel 204) comes ON.	a) The Exp 1 Rcdr Tape Motion Monitor channel (normally K509) indicates tape motion whenever the Exp Rcdr Conv is powered-up, that is, provided the end-of-tape has not been reached.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The crew can manually remove power from the Exp 1 Rcdr.	b) (1) Crew informs ground of the observed anomaly. (2) Crew switches Tape Rcdrs to the manual mode and removes power from the Exp 1 Rcdr.	b) (1) Ground requests that the crew manually control the Tape Rcdr.	b) IIIb	
	M	a) Pole B or Pole C or Pole D or Pole E or Pole F fails open in the latch position.	a) None. This relay is in the reset position at lift-off and is expected to remain in this position during a normal mission. The latch position is used for certain manually controlled Transmitter functions.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B or Pole C or Pole D or Pole F fails open in the reset position.	a) None. These poles are functional in this position only if the Transmitters are being manually controlled. During a normal mission the Transmitters are controlled by the ground.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Manual Control Relay #2" (K3-95 (52-79703-53)	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
or							
Relay, Latching, "Xmtr B Manual Control Relay #2" (K3-234) (52-79703-53)	M	a) Reset coil fails open.	a) None. The relay is in the reset position at lift-off and is expected to remain in this position for a normal mission.	a) None.	a) None.	a) N/A	----
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
or							
Relay, Latching, "Xmtr C Manual Control Relay #2" (K3-243) (52-79703-53)	M	a) Latch coil fails open.	a) Respective Transmitter cannot be manually configured for transmission of recorded Exp 1, Exp Voice or Exp 2 data.	a) None.	a) None.	a) N/A	----
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. During a normal mission, the ground controls the TM Transmitters, thus the latch position is not used during a normal mission.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Manual Control Relay #9" (K3-102) (52-79703-61) 3.2.20	L M S	a) Pole C fails open in the reset position.	a) Power is applied to the Data Rcdr whenever the PCM Bus Conv is powered-up.	a) If the Data Rcdr reaches the end-of-tape, the Data Rcdr "STOP" light (on Panel 204) comes ON.	a) The Data Rcdr Tape Motion Monitor channel (normally K508) indicates tape motion whenever the PCM Bus Conv is powered-up, that is, provided the end-of-tape has not been reached.	a) N/A	----
or Relay, Latching, "Xmtr B Manual Control Relay #9" (K3-241) (52-79703-61) 3.2.30		b) Insulating film on contacts due to contamination.	b) None. The crew can manually remove power from the Data Rcdr.	b) (1) Crew informs ground of observed anomaly. (2) Crew switches Tape Rcdrs to the manual mode and removes power from the Data Rcdr.	b) (1) Ground requests that the crew manually control the Tape Rcdrs.	b) IIIb	
or Relay, Latching, "Xmtr C Manual Control Relay #9" (K3-250) (52-79703-61) 3.2.40	M	a) Pole B or Pole D or Pole E or Pole F fails open in the reset position.	a) None. These poles are functional in this position only if the Transmitters are being manually controlled. During a normal mission the Transmitters are controlled by the ground.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole B or Pole C or Pole D or Pole E or Pole F fails open in the latch position.	a) None. This relay is in the reset position at lift-off and is expected to remain in this position during a normal mission. The latch position is used for certain manually controlled Transmitter functions.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Manual Control Relay #9" (K3-102) (52-79703-61)	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
or							
Relay, Latching, "Xmtr B Manual Control Relay #9" (K3-241) (52-79703-61)	M	a) Reset coil fails open.	a) None. The relay is in the reset position at lift-off and is expected to remain in this position for a normal mission.	a) None.	a) None.	a) N/A	----
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
or							
Relay, Latching, "Xmtr C Manual Control Relay # 9" (K3-250) (52-79703-61)	M	a) Latch coil fails open.	a) Respective Transmitter cannot be manually configured for transmission of recorded Data, Voice or Exp 2 data.	a) None.	a) None.	a) N/A	----
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. During a normal mission, the ground controls the TM Transmitters, thus the latch position is not used during a normal mission.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 2 Dump Relay #3" (K3-290) (52-79703-53) 3.2.45	L M S	a) Pole F fails open in the reset or latch position.	a) None - This pole is a spare.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Power is supplied to the Exp 2 Rcdr whenever the Exp Rcdr Conv is powered-up.	a) If the end-of-tape is reached, the Exp 2 Rcdr "STOP" light (on Panel 204) comes ON.	a) If the end-of-tape has not been reached, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew can manually remove power from the Rcdr.	b) (1) Crew notifies ground of the observed anomaly. (2) Crew manually removes power from the Exp 2 Rcdr.	b) Ground requests that the crew manually remove power from the Exp 2 Rcdr.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) Power is not supplied to the Exp 2 Rcdr when the ground gives the Exp 2/Data 2 Dump Enable ON command (12-2).	a) None.	a) (1) The Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is no tape motion. (2) When the Exp 2/Data 2 Rcdr Dump Execute DUMP command (32-4) is given, data is not received from the Exp 2 Rcdr. (3) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 & M522) indicate the Exp Rcdr Conv is powered-up. (4) Channels K322 and K352 indicate the Exp 2 Rcdr Dump & Execute commands have been correctly received and decoded by the DCS.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp. 2 Dump Relay #3" (K3-290) (52-79703-53) (Continued)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can restore power to the Rcdr for dumping data.	b) None.	b) (1) Ground requests that the crew manually dump the Exp 2 Rcdr, or (2) Ground uses the Tape Recording - Data 2 RECORD command (S330) along with the Exp 2/ Data 2 Dump Enable ON command. This restores power to the Exp 2 Rcdr.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) (1) Power is not removed from the Exp Rcdr Conv when the crew switches "EXP 1" and/or "EXP 2" Record switches to the "OFF" position and the ground commands Exp 1 & Exp Voice Dump Enable OFF (10-2) and/or the Exp 2/ Data 2 Dump Enable OFF (12-2). Power is removed from the Exp 2 Rcdr. (2) Power is not applied to the Exp Rcdr Conv when the Exp 1 & Exp Voice Dump Enable ON command (10-2) is given.	a) None.	a) (1) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 & M522) indicate Exp Rcdr Conv is powered-up. (2) The Exp 1 Rcdr tape motion monitor indicates there is no tape motion. The Exp Rcdr bus voltage monitor indicates zero volts. (3) The appropriate DCS command verification channel indicates the command has been correctly received & decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can restore power to the Exp Rcdr Conv for dumping the Exp 1 Rcdr. Ground can remove power from the Exp Rcdr Conv.	b) None.	b) (1) Ground requests that the crew manually dump the Exp 1 Rcdr, or (2) Ground uses the Exp 2/ Data 2 Dump Enable ON command (12-2) to power up the Exp Rcdr Conv. This is immediately followed by the Exp 2/ Data 2 Dump Enable OFF command (12-2). The Exp Rcdr Conv continues to receive power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 2 Dump Relay #3" (K3-290) (52-79703-53) (Continued)					b) (3) To remove power from the Exp Rcdr Conv, when all PCM Bus and Exp Rcdr Bus equipment is powered-down, the ground momentarily switches the PCM Bus Select A/B commands (S274/S275).		
	L M S	a) Pole D fails open in the latch position.	a) Power is not applied to the Exp Rcdr Conv when the ground gives the Exp 2/Data 2 Dump Enable ON (12-2) command.	a) None.	a) (1) The Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is no tape motion. (2) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 & M522) indicate zero volts. (3) When the Exp 2/Data 2 Rcdr Dump Execute DUMP command (32-4) is given, data is not received from the Exp 2 Rcdr. (4) Channels K332 & K352 indicate the Exp 2 Rcdr Dump & Execute commands respectively have been correctly received & decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can restore power to the Rcdr for dumping data.	b) None.	b) (1) Ground requests that the crew manually dump the Exp 2 Rcdr, or (2) Ground uses the Tape Recording - Data 2 RECORD command (S330) along with the Exp 2/ Data 2 Dump Enable ON command. This restores power to the Exp 2 Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 2 Dump Relay #3" (K3-290) (52-79703-53) (continued)	L M S	a) Pole C fails open in the latch position.	a) (1) Power is not supplied to Xmtr A when the Exp 2/ Data 2 Dump Enable ON command (12-2) is given. (2) No effect if Exp 2 Rcdr data is being dumped via Xmtr B or Xmtr C.	a) None.	a) (1) Carrier wave is not received from Xmtr A. (2) Appropriate DCS verification channel indicates the dump command (12-2) has been correctly received and decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) (1) The ground switches to Xmtr B or Xmtr C for transmitting Exp 2 Rcdr data, or (2) Ground requests that the crew manually dump Exp 2 Rcdr thru desired Xmtr.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None- Pole C is not functional in the reset position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
		a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B of Relay K3-291.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
		a) Pole A fails open in the reset or latch position.	a) None- GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 2 Dump Relay #3" (K3-290) (52-79703-53) (Continued)	L M S	a) Latch coil fails open.	a) (1) Power is not supplied to the Exp Rcdr or Xmtr A when the Exp 2/Data 2 Dump Enable ON command (12-2) is given. Also power is not supplied to the Exp Rcdr Conv. (2) Power to the Xmtr is not affected if Exp 2 Rcdr data is to be Xmitted by Xmtr B or Xmtr C.	a) None.	a) (1) The Exp Rcdr Bus voltage monitors (normally M520, M521 & M522) indicate zero volts. (2) The Exp 2 Rcdr tape motion monitor channel (normally K510) indicates no tape motion. (3) Carrier wave is not received from Xmtr A. (4) Exp 2 Rcdr data is not received when the Dump Execute command (32-4) is given. (5) DCS verification channels (K332 & K352) indicate dump & execute commands have been correctly received and decoded by the DCS.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can restore lost power.	b) None.	b) (1) The ground switches to Xmtr B or Xmtr C for Xmitting Exp 2 Rcdr data. (2) Ground uses the Tape Recording - Data 2 RECORD command (S330) along with the Exp 2/Data 2 Dump Enable ON command. This restores power to the Exp 2 Rcdr. (3) Also, ground can request that the crew manually dump the Exp 2 Rcdr.	b) IIIb	

COMPONENT	PHASE MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 2 Dump Relay #3" (K3-290) (52-79703-53) (Continued)	M	a) Reset coil fails open.	a) (1) When the Exp 2/Data 2 Dump Enable OFF command (12-2) is given, power is not removed from Xmtr A. (2) When the crew switches "EXP 1" and/or "EXP 2" Record switches to the "OFF" position and the ground commands Exp 1 & Exp Voice Dump Enable OFF (10-2) and/or Exp 2/Data 2 Dump Enable OFF (12-2), power is not removed from the Exp Rcdr Conv and the Exp 2 Rcdr.	a) When the end-of-tape is reached, the Exp 2 Rcdr "STOP" light (on Panel 204) comes ON.	a) (1) Carrier wave is received from Xmtr A. (2) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 & M522) indicate the Exp Rcdr Conv is powered-up. (3) If the end-of-tape has not been reached, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is tape motion. (4) The appropriate DCS verification channels indicate the commands have been correctly received & decoded by the DCS.	a) N/A	
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Power cannot be removed from the Exp Rcdr Conv except by opening its circuit breaker. During storage there will be a loss of recorded Data 2 (subframe 4) if power is manually removed from the Exp 2 Rcdr.	b) (1) Crew informs ground of the anomaly. (2) Crew manually removes power from the Exp 2 Rcdr. (3) In preparation for storage, the crew must manually configure the desired Rcdr as the Data Rcdr.	b) (1) Ground uses the S454 DCS command. This removes power from Xmtr A. R/T TM is then transmitted by Xmtr B. (2) Aternately - Ground requests that the crew manually configure the Xmtrs. (3) Ground requests that the crew manually remove power from the Exp 2 Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 2 Dump Relay #3" (K3-290) (52-79703-53) (Continued)	L S	a) Reset coil fails open.	a) (1) When the Exp 2/Data 2 Dump Enable OFF command (12-2) is given, power is not removed from Xmtr A, the Exp Rcdr Conv, and the Exp 2 Rcdr.	a) N/A	a) (1) Carrier wave is received from Xmtr A. (2) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 & M522) indicate the Exp Rcdr Conv is powered-up. (3) If the end-of-tape has not been reached, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is tape motion. (4) The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS.	a) N/A	
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Power cannot be removed from the Exp Rcdr Conv or the Exp 2 Rcdr. Excessive operating time on the Exp 2 Rcdr may necessitate premature replacement of the Rcdr.	b) N/A	b) (1) Ground uses the S454 DCS command. This removes power from Xmtr A. R/T TM is then transmitted by Xmtr B.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 2 Dump Relay #2" (K3-291) (52-79703-45) 3.2.46	L M S	a) Pole D fails open in the latch position.	a) When ground gives the R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2) commands, power is not applied to Xmtr B for transmitting Exp 2 Rcdr data.	a) None.	a) (1) Carrier wave is not received from Xmtr B. (2) Appropriate DCS verification channel indicates the dump command (12-2) has been correctly received and decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Exp 2 Rcdr can be dumped via Xmtr A or Xmtr C.	b) None.	b) (1) The ground switches to Xmtr A or Xmtr C for transmitting Exp 2 Rcdr data, or (2) Ground requests that the crew manually dump Exp 2 Rcdr via desired Xmtr.	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) The system cannot be configured to dump the Exp 2 Rcdr via Xmtr C.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None - The Exp 2 Rcdr is normally dumped via Xmtr A or Xmtr B.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy is provided on Pole B of Relay K3-290.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 2 Dump Relay #2" (K3-291) (52-79703-45) (Continued)	L M S	a) Pole C or Pole D fails open in the reset position.	a) None - These poles are not functional in the reset position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Latch coil fails open.	a) If the system is configured for dumping the Exp 2 Rcdr via Xmtr B (or Xmtr C), power is not supplied to the Xmtr when the Exp 2/Data 2 Dump Enable ON command (12-2) is given.	a) None.	a) (1) Carrier wave is not received from the affected Xmtr. (2) Appropriate DCS verification channel indicates the dump command (12-2) has been correctly received and decoded by the DCS.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Exp 2 Rcdr can be dumped via Xmtr A.	b) None.	b) (1) The ground switches to Xmtr A for transmitting Exp 2 Rcdr data, or (2) Ground requests that the crew manually dump the Exp 2 Rcdr via desired Xmtr.	b) IIIb	
	L M S	a) Reset coil fails open.	a) If the system is configured for dumping the Exp 2 Rcdr via Xmtr B (or Xmtr C), power is not removed from the Xmtr when the Exp 2/Data 2 Dump Enable OFF command (12-2) is given.	a) None.	a) (1) Ground receives carrier wave from affected Xmtr even though Dump Enable OFF command (12-2) has been given. (2) Exp 2 Rcdr tape motion monitor indicates no tape motion. (3) Appropriate DCS verification channel indicates the Dump Enable OFF command has been correctly received and decoded by the DCS.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILUPE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 2 Dump Relay #2" (K3-291) (52-79703-45) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None - Exp 2 Rcdr can be dumped via Xmtr A.	b) None.	b) (1) Ground switches to Xmtr A for tranmitting Exp 2 Rcdr data, or (2) Ground requests that the crew manually control the dumping of data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release "DCS Exp 2 Dump Relay #1" (K3-108) (52-79715-13) 3.2.47	L M S	a) Pole B fails open when the coil is energized or the coil fails open.	a) There is a loss of DCS capability to dump to Exp 2 Rcdr.	a) None.	a) (1) When the Exp 2/Data 2 Dump Enable ON command (12-2), the carrier wave is not received from the Xmtr which has been designated for transmitting Exp 2 Rcdr data. (2) The appropriate DCS verification channel indicates the dump command has been correctly received and decoded by the DCS. (3) The Exp Rcdr Bus voltage monitor channels indicate zero volts (4) The Exp 2 Rcdr tape motion monitor channel indicates no tape motion.	a) N/A	----
		b) Contamination, or mechanical or thermal stress.	b) There is a loss of recorded Data 2 (subframe 4) during unmanned phases.	b) None.	b) (1) The ground requests that the crew manually dump the Exp 2 Rcdr.	b) IIIb	
	L S	a) Pole A fails open when the coil is energized or the coil fails open.	a) When the Exp 2/Data 2 Dump Enable OFF command (12-2) is given, power is not removed from Xmtr A. If ground has commanded R/T TM ON, power is applied to Xmtr B even though data is not being transmitted on Xmtr B. Also, power is not removed from the Exp Rcdr Conv and the Exp 2 Rcdr.	a) None.	a) (1) Carrier wave is received from the Xmtr which is powered-up but not transmitting data. (2) The Exp Rcdr Bus voltage monitor channels (normally M520, M521, & M522) indicate the Exp Rcdr Conv is powered-up. (3) If the end-of-tape has not been reached, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is tape motion.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "DCS Exp 2 Dump Relay #1" (K3-108) (52-79715-13) (Continued)					a) (4) The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS.		
		b) Contamination, or mechanical or thermal stress.	b) Excessive operating time on the Exp 2 Rcdr may necessitate premature replacement of the Rcdr.	b) None.	b) None.	b) IIIb	
	M	a) Pole A fails open when the coil is energized, or the coil fails open.	a) (1) When the Exp 2/Data 2 Dump Enable OFF command (12-2) is given, power is not removed from Xmtr A. If ground has commanded R/T TM ON, power is applied to Xmtr B even though data is not being transmitted on Xmtr B. (2) When the crew switches "EXP 1" and/or "EXP 2" Record switches to the OFF position and the ground commands Exp 1 & Exp Voice Dump Enable OFF (10-2) and/or Exp 2/Data 2 Dump Enable OFF (12-2), power is not removed from the Exp Rcdr Conv and the Exp 2 Rcdr.	a) When the end-of-tape is reached, the Exp 2 Rcdr "STOP" light (on Panel 204) comes ON.	a) (1) Carrier wave is received from the Xmtr which is powered-up but not transmitting data. (2) The Exp Rcdr Bus voltage monitor channels (normally M520, M521, and M522) indicate the Exp Rcdr Conv is powered-up. (3) If the end-of-tape has not been reached, the Exp 2 Rcdr tape motion monitor channel (normally K510) indicates there is tape motion. (4) The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS.	a) N/A	----
		b) Contamination, or mechanical or thermal stress.	b) Power cannot be removed from the Exp Rcdr Conv except by opening its circuit breaker. Power can be removed from the Exp 2 Rcdr and the unused Xmtr.	b) (1) Crew informs ground of the observed anomaly. (2) Crew manually removes power from the Exp 2 Rcdr. (3) In preparation for storage, the crew must manually configure the desired Rcdr as the Data Rcdr.	b) (1) Ground requests that the crew open the circuit breaker for Xmtr A. Ground uses the S454 DCS command so that R/T TM is transmitted via Xmtr B. When Xmtr A is needed, ground must request that the crew close the circuit breaker. (2) Alternately, the ground requests that the crew manually control the transmission of recorded data and R/T TM.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "DC3 Data Dump Relay #3" (K3-289) (52-79703-61) 3.2.48	L M S	a) Pole F fails open in the reset position.	a) None. Pole F is not functional in the reset position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole F fails open in the latch position.	a) There is a loss of playback signal to the Data Rcdr when the ground gives the Data Dump Enable ON (6-1) and Data Rcdr Dump Execute Dump (15-2) commands.	a) None.	a) Data is not received from the Data Rcdr.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still dump the Data Rcdr.	b) None.	b) (1) Ground uses the Data & Voice Dump Enable command (16-2) to restore the playback signal to the Data Rcdr, or (2) Ground requests that the crew manually dump the Data Rcdr.	b) IIIb	
	L M S	a) Pole D fails open in the latch position.	a) If the ground gives the Data Dump Enable ON (6-1) and Data Rcdr Dump Execute DUMP (15-2) commands while the crew is recoding Voice, the Voice Record lights (green) do not turn OFF.	a) The Voice Record lights (green) stay on while ground is dumping Data from the Data Recorder. Ground must inform crew that Data Rcdr is being dumped in order that the crew recognize that the Voice Record lights should turn OFF.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) There may be a loss of some Voice data prior to the time that the failure is detected.	b) (1) Crew informs ground that the Voice Record lights did not turn OFF.	b) (1) Ground informs crew prior to dumping Data from the Data Rcdr, or (2) Ground uses the Data & Voice Dump Enable ON command (16-2) when they wish to dump the Data Rcdr. This command removes power from the Voice Record lights.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data Dump Relay #3" (K3-289) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) (1) When the ground gives the Data & Voice Dump Enable ON command (16-2), the Data Rcdr power relays do not cycle to the latch position. Power is not applied to the Data Rcdr. (2) If Data Rcdr is running, the Data Rcdr power relays do not cycle to the reset (OFF) position when Rcdr is commanded OFF. Rcdr is powered-up whenever PCM Bus Conv is powered-up.	a) If the end-of-tape is reached, the Data Rcdr "STOP" light (on Panel 204) comes ON.	a) (1) Data and Voice are not received from the Data Rcdr when the ground attempts to dump the Data Rcdr. (2) The Data Rcdr tape motion monitor channel indicates there is no tape motion. (3) The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS. (4) If Rcdr is powered-up when failure occurs, the tape motion monitor channel indicates the Data Rcdr is operating whenever the PCM Bus Conv is powered-up.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Power to the Data Rcdr for dumping data can be provided by DCS commands. If necessary, the crew can manually dump the Data Rcdr. If Data Rcdr power relays are in latch position, ground or crew can reset them.	b) (1) Crew informs ground of anomaly. (2) Crew manually removes power from the Data Rcdr. upon request from the ground.	b) (1) Ground gives the Data & Voice Dump Enable ON command (16-2) followed by the Data Dump Enable ON command (6-1). Then the Data & Voice Dump Enable OFF command (16-2) is given. This sequence of commands supplies power to the Data Rcdr. (2) When the Rcdrs are all commanded OFF, ground can reset the affected relays by momentarily using the PCM Bus Select commands (S274/S275), or ground requests that the crew manually remove power from the Rcdrs.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data Dump Relay #3" (K3-289) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the latch position.	a) When the ground gives the Data Dump Enable ON command (6-1), the Data Rcdr power relays do not cycle to the latch position. Power is not applied to the Data Rcdr.	a) None.	a) (1) Data is not received from the Data Rcdr when the ground attempts to dump the Data Rcdr. (2) The Data Rcdr tape motion monitor channel indicates there is no tape motion. (3) The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Power to the Data Rcdr for dumping data can be provided by DCS commands. If necessary, the crew can manually dump the Data Rcdr.	b) None.	b) (1) Ground gives the Data & Voice Enable ON command (16-2) followed by the Data Dump Enable ON command (6-1). Then the Data & Voice Dump Enable OFF command (16-2) is given. This sequence of commands supplies power to the Data Rcdr.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Power is not supplied to the MDA, AM and OWS Voice Record lights (green) when the crew switches one of the Voice Record switches to the "RECORD" position.	a) The Voice Record lights do not come ON when the crew switches one of the Voice Record switches to the "RECORD" position.	a) (1) Data Recorder tape motion monitor channel (normally K508) indicates the Rcdr had tape motion at the time the crew switched a Voice Record switch to the "RECORD" position.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None, other than an inconvenience. Voice Record lights are only an indicator.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of anomaly.	b) (1) Ground coordinates with crew in determining whether a change in operating procedures is necessary due to the loss of Voice Record lights. (2) Ground informs crew whenever they dump the Data Recorder.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data Dump Relay #3" (K3-239) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) (1) Power is not removed from the PCM Bus Conv when the ground commands R/T TM OFF (11-2), Data & Voice Dump Enable OFF (16-2), Data Dump Enable OFF (6-1), and the on-board "EXP 1", "EXP 2", "TAPE RECORDING DATA" and Voice Record switches are in the "OFF" position. (2) If PCM Bus Conv is OFF when the failure occurs, power is not supplied to to the Conv when the ground commands Data & Voice Dump Enable ON (16-2) or R/T TM ON (11-2). This power is necessary for carrying out these commands.	a) None.	a) (1) The temperature of the Conv may be slightly higher than expected after periods of time during which the Conv has supposedly been powered-down. (2) R/T TM and/or Data & Voice are not received, only the TM Transmitter carrier wave(s).	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) None, other than excessive power consumption. Ground can remove power from the PCM Bus Conv. (2) Ground can restore necessary power for R/T TM and/or Data & Voice Dump.	b) None.	b) (1) The ground can remove power from the Conv by momentarily switching the Bus A/Bus B functions with the PCM Bus Select commands (S274/S275). (2) Ground uses the Data Dump Enable ON command (6-1) prior to the R/T TM ON (11-2) and/or Data & Voice Dump Enable ON (16-2) commands. After these second commands are given, the Data Dump Enable OFF command (6-1) can be given.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data Dump Relay #3" (K3-289) (52-79703-61)	L M S	a) Pole C fails open in the latch position.	a) When ground gives the Data Dump Enable ON command (6-1), power is not supplied to the PCM Bus Conv, and subsequently to the Data Rcdr.	a) None.	a) Data is not received from the Data Rcdr.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None. Ground can perform alternate switching to obtain the necessary power.	b) None.	b) (1) Instead of the Data Dump Enable ON command (6-1), the Data & Voice Dump Enable ON (16-2) command is used, followed by the Data Dump Enable ON (6-1) and the Data & Voice Dump Enable OFF (6-1) commands. Power is then supplied to the PCM Bus Conv.		
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relay K3-110.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data Dump Relay #3" (K3-289) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) Power is not removed from the PCM Bus Conv and the Data Rcdr when the ground gives the Data Dump Enable OFF command (6-1).	a) If the end-of-tape is reached, the Data Rcdr "STOP" light (on Panel 204) comes ON.	a) (1) If R/T TM is on, the Data Rcdr tape motion monitor channel indicates there is tape motion. (2) The temperature of the PCM Bus Conv may be slightly higher than expected after periods of time when the Conv has supposedly been powered-down.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) During unmanned phases, power cannot be removed from the Data Rcdr. Excessive operating time on the Rcdr may necessitate premature replacement of the Rcdr.	b) If deemed necessary, crew can remove power from the PCM Bus Conv by opening its circuit breaker.	b) (1) Ground requests that the crew manually remove power from the Data Rcdr.	b) IIIb	
	L M S	a) Latch coil fails open.	a) When the ground gives the Data Dump Enable ON command (6-1), power is not supplied to the PCM Bus Conv and/or the Data Rcdr.	a) None.	a) (1) Ground does not receive data from the Data Rcdr. (2) If R/T TM is being transmitted, the Data Rcdr tape motion monitor channel (normally K508) indicates no tape motion. The appropriate DCS verification channel indicates the dump command has been correctly received and decoded by the DCS.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. The ground can still dump the Data Rcdr, as can the crew.	b) None.	b) (1) Ground uses the Data & Voice Dump Enable ON (16-2) command to obtain data from the Data Rcdr, or (2) Ground requests that the crew manually dump the Data Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data Dump Relay #2" (K3-110) (52-79703-53) 3.2.49	L M S	a) Pole F or Pole E or Pole D fails open in the reset position.	a) None. These poles are not functional in the reset position.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole F or Pole D fails open in the latch position.	a) None. During a normal mission i.e. with DCS commands, S454, S452, & S151 in effect, these poles serve no purpose in the latch position.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) When the ground gives the Data Dump Enable ON command (6-1), power is not supplied to Xmtr C for transmission of the data.	a) None.	a) 1. Ground does not receive a carrier wave from Xmtr C. 2. The Data Rcdr tape motion monitor channel (normally K508) indicates there is tape motion. 3. The appropriate DCS verification channel indicates the dump command has been correctly received and decoded by the DCS.	a) N/A	
		b) Insulating film on contacts due to contamination	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) 1. The ground switches to another Xmtr for the Data Recorder dump or uses the Data & Voice Dump Enable ON command (16-2), or 2. Ground requests that the crew manually dump the Data Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data Dump Relay #2" (K3-110) (52-79703-53) (Continued)	M	a) Pole C fails open in the reset position.	a) With the Exp 1 & Exp Voice Dump Enable ON command (10-2) in effect, when the Data Dump Enable OFF command (6-1) is given, Relays K3-298 and K3-255 do not reset. If ground then gives the Exp 2 Dump Enable ON (12-2) or R/T TM ON (11-2) command, the data output signal to the Xmtr A is to open contacts (Pole C on K3-298).	a) None.	a) (1) Exp 2 Rcdr or R/T TM data is not received from Xmtr A, only the carrier wave.	a) N/A	----
		b) Insulating film on contacts due to contamination	b) None. Ground can still obtain desired information via DCS commands.	b) None.	b) (1) Ground gives the Exp 1 & Exp Voice Dump Enable OFF command (10-2). This resets K3-298 and K3-255. Ground then gives the Exp 1 & Exp Voice Dump Enable ON command (10-2) along with the R/T TM OFF (11-2) or Exp 2 Dump Enable ON (12-2) commands. Proper data/voice transmission is restored.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relay K3-289.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data Dump Relay #2" (K3-110) (52-79703-53) (Continued)	M	a) Pole C fails open in the latch position.	a) With the Exp 1 & Exp Voice Dump Enable ON command (10-2) in effect, when the Data Dump Enable ON command (6-1) is given, Relays K3-298 & K3-255 do not cycle to the latch position as required. Power is not supplied to Xmtr A nor is the T/R Data output signal.	a) None	a) Carrier wave is not received from Xmtr A.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) Ground does not attempt to dump Exp 1 & Exp Voice and Data (subframe 1) at the same time. If necessary, ground requests that the crew manually dump Exp 1, Exp Voice and Data simultaneously.	b) IIIb	
	L M S	a) Reset coil fails open.	a) When the Data Dump Enable OFF command (6-1) is given, power is not removed from Xmtr C.	a) None	a) Carrier wave is received from Xmtr C.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Power can be removed from the Xmtr by changing to manual control of the Xmtrs. DCS commands can only determine which Xmtr will be continuously powered-up.	b) None	b) (1) Ground requests that the crew manually control the TM Xmtrs. (2) During storage, the ground may choose to use S453, S150, and S195 DCS commands so that power is continuously applied to the 2-watt TM Xmtr instead of one of the 10-watt TM Xmtrs. This conserves power and reduces the probability of a 10-watt Xmtr failure.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data Dump Relay #2" (K3-110) (52-79703-53) (Continued)	L M S	a) Latch coil fails open.	a) When the ground gives the Data Dump Enable ON command (6-1), power is not supplied to the designated TM Xmtr for transmission of the Data Rcdr data.	a) None	a) (1) Ground does not receive carrier wave from the Data Rcdr TM Xmtr. (2) On R/T TM, the appropriate DCS verification channel indicates the dump command has been correctly received and decoded by the DCS. Also, the Data Rcdr tape motion monitor channel indicates there is tape motion.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground or crew can still dump the Data Rcdr.	b) None	b) (1) Ground uses the Data & Voice Dump Enable ON command (16-2) to dump data from the Data Rcdr, or, (2) Ground requests that the crew dump the Data Rcdr.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "DCS Data Dump Relay #1" (K3-109) (52-79715-13) 3.2.50	L S M	a) 1. Pole B fails open when the coil is energized or 2. The coil fails open when Relays K3-289 and K3-110 are in the reset position.	a) 1. When the ground gives the Data Dump Enable on command (6-1) power is not supplied to the PCM Bus Conv, the Data Rcdr and the TM Xmtr for transmitting the Data Rcdr Data. 2. Note - There are other commands which may have already powered-up the PCM Bus Conv, however, the Rcdr and Xmtr do not receive power.	a) None.	a) 1. Carrier wave is not received from the TM Xmtr for transmitting the Data Rcdr data. 2. If R/T TM is ON, the Data Rcdr Tape Motion monitor channel indicates there is no tape motion. 3. The appropriate DCS verification channel indicates the dump command has been correctly received and decoded by the DCS.	a) N/A	
		b) 1. Insulating film on contacts due to contamination 2. Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can still dump the Data Rcdr.	b) None.	b) 1. Ground uses the Data & Voice Dump Enable ON Command (16-2) to obtain data from Data Rcdr, or 2. Ground requests that the crew manually dump the Data Rcdr.		
	L S M	a) 1. Pole A fails open when the coil is energized, or 2. The coil fails open when Relays K3-289 and K3-110 are in the latch position.	a) When ground gives the Data Dump Enable OFF command (6-1) Relays K3-289 and K3-110 do not reset. Power is not removed from the PCM Bus Conv. the Data Rcdr or TM Xmtr C.	a) None.	a) 1. Carrier wave and Data Rcdr data continue to be received. 2. R/T TM indicates that the Data Rcdr has tape motion provided end-of-tape has not been reahed. 3. Appropriate DCS verification channel indicates command has been correctly received and decoded by the DCS.	a) N/A	
		b) 1. Insulating film on contacts due to contamination, or 2. Defective wire or terminal due to mechanical or thermal stress.	b) 1. During manned phases, crew can remove power from the Data Rcdr and the TM Xmtr. 2. During unmanned phases, the excessive operating time accumulated on the Data Rcdr may necessitate premature replacement of the Rcdr.	b) None.	b) 1. Ground requests that the crew manually control the tape Rcdrs and TM Xmtrs. 2. If failure occurs during storage, ground may choose to use S453, S190 and S195 DCS commands so that power is continuously applied to the 2-watt TM Xmtr instead of one of the 10-watt TM Xmtrs.	b) IIIb	

*COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW c) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Back-up R/T TM Relay #2" (K3-212) (52-79703-61) 3.2.51	L M S	a) Pole F fails open in the reset or latch position.	a) None - Pole F is a spare.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) (1) When the ground commands Data and Voice Dump Enable ON (16-2), there is a loss of the Data Rcdr Voice (Channel B) output to the TM Xmtr. (2) When the ground commands R/T TM on (11-2) and Exp 2/ Data 2 Dump Enable ON (12-2), there is a loss of the Exp 2 Rcdr data (Channel A) output signal to the TM Xmtr. (3) When the ground commands Exp 1 and Exp Voice Dump Enable ON (10-2), there is a loss of the Exp 1 Rcdr Voice (Channel B) output to the TM Xmtr.	a) None	a) (1) Ground observes a loss of Voice transmission from the TM Xmtr, only the carrier wave is received. (2) Ground observes a loss of data from the Exp 2 Rcdr. Only the carrier wave from TM Xmtr is received (along with the R/T TM from its Xmtr). (3) Ground observes a loss of Exp Voice transmission from the TM Xmtr, only the carrier wave is received.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None, crew or ground can perform necessary switching to overcome the failure.	b) None	b) (1) Ground does not simultaneously command R/T TM ON and Exp 2/Data 2 Dump Enable ON or ground uses the Back-up R/T TM ON command along with the Exp 2/Data 2 Dump Enable ON command. (2) Ground requests that the crew manually dump Data and Voice and Exp 1 and Exp Voice.	b) IIIb	
	L M S	a) Pole E or Pole D or Pole C or Pole B fails open in the latch position.	a) None - The Back-up R/T TM ON command is not expected to be used during a normal mission.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "DCS Back-up R/T TM Relay #2" (K3-212) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) When the ground gives the R/T TM ON (11-2) command, there is a loss of the Real Time TM signal from the Pgmr to the TM Xmtr.	a) None	a) (1) Ground does not receive R/T TM data. Only the Xmtr's carrier wave is received.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can still transmit R/T TM data.	b) None	b) (1) Ground uses the Back-up R/T TM ON command (S268), or (2) Ground requests that the crew transmit R/T TM data.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) There is a continuous application of power to the MDA and OWS-1 and -2 Signal Conditioners.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) Power is continuously applied to the PCM Bus Conv.	a) None	a) The temperature of the PCM Bus Conv may be slightly higher than expected after periods of time when the Conv has supposedly been powered-down.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) When all functions requiring Bus A and Bus B power are commanded OFF, the ground momentarily uses the PCM Bus Select commands (S274/S275) to remove power from the Conv.		
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Back-up R/T TM Relay #2" (K3-212) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) None - Relay is in the reset position at lift-off and is expected to remain in this position during a normal mission.	a) None	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) Ground cannot use the Back-up R/T TM ON command (S268) to obtain R/T TM data.	a) None	a) R/T TM data is not received when Back-up R/T TM ON command is given.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. If the ground cannot receive R/T TM via the normal R/T TM ON command, there is a loss of R/T TM data. Back-up R/T TM ON command is not used during a normal mission.	b) None	b) (1) Ground requests that the crew manually dump R/T TM data.	b) N/A - Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "DCS R/T TM Relay #4" (K3-292) (52-79703-61) 3.2.53	L M S	a) Pole F or Pole E fails open in the reset position.	a) There is a loss of the Exp 2 Rcdr output signal to the TM Xmtr when the ground attempts to dump the Exp 2 Rcdr.	a) None	a) (1) Exp 2 Rcdr data is not received. (2) Appropriate DCS verification pulse indicates the command was correctly received & decoded by the DCS.	a) N/A	---
		b) Insulation film on contacts due to contamination.	b) None. Ground or crew can take corrective action to restore the Exp 2 Rcdr data output to the TM Xmtr.	b) None	b) (1) Concurrently with the Exp 2 Rcdr Dump command, the ground gives the R/T TM ON command (11-2). This restores the Exp 2 Rcdr output signal to the TM Xmtr, or (2) Crew requests that the crew manually dump the Exp 2 Rcdr.	b) IIIb	
	L M S	a) Pole F fails open in the latch position.	a) There is a loss of the R/T TM signal to the TM Xmtr when the ground gives the R/T TM ON (11-2) command.	a) None	a) (1) R/T TM data is not received. (2) Appropriate DCS verification pulse indicates the command was correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contact due to contamination	b) None. Ground or crew can take corrective action to restore the R/T TM signal to the TM Xmtr.	b) None	b) (1) The ground gives the backup R/T TM ON command (S268). R/T TM Data is received via Xmtr B, or (2) Ground requests that the crew manually transmits R/T TM.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS R/T TM Relay #4" (K3-292) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the latch position.	a) There is a loss of the Exp 2 Rcdr output signal to the TM Xmtr when the ground gives both the R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2) commands.	a) None	a) (1) Exp 2 Rcdr data is not received. (2) Appropriate DCS verification channels indicate the dump and execute commands were correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) Insulation film on contacts due to contamination.	b) None. Crew or ground can perform corrective action to restore Exp 2 Rcdr data.	b) None	b) (1) Ground uses the Backup R/T TM command (S268) so that Exp 2 Rcdr data and R/T TM can be received simultaneously, or (2) Ground does not dump R/T TM and Exp 2 Rcdr simultaneously, or (3) Ground requests that the crew manually transmit desired data.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Power is not removed from the MDA and OWS -1 and -2 Signal Conditioners when the crew returns all the Voice Record and Exp 1 switches to the "OFF" position and the R/T TM OFF (11-2) and Tape Recording - Data OFF (S377) commands are in effect.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B of Relays K3-293 and K3-106.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS R/T TM Relay #4" (K3-292) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the latch position.	a) Power is not supplied to the MDA and OWS -1 and -2 Signal Conditioner when the R/T TM ON command (11-2) is given.	a) None	a) Data is not received from the MDA and OWS -1 and -2 Signal Conditioners.	a) N/A	- - - - - - - - - -
		b)	b) None. Data from the affected signal conditioners can be restored by the crew or ground.	b) None	b) (1) Ground gives Backup R/T TM command (S268). R/T TM data from the affected signal conditioners is restored or (2) Ground requests that the crew manually transmit R/T TM data.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Power is continuously applied to the PCM Bus Conv.	a) None	a) After periods of time when the PCM Bus Conv has supposedly been powered-down, the Conv. temperature is higher then expected.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Power can be removed from the Conv.	b) None	b) When all equipment requiring Bus A or Bus B power is commanded OFF, ground can remove power from the PCM Bus Conv by switching the Bus A/Bus B functions (S274/S275).	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) Power is not supplied to the PCM Bus Conv when ground commands R/T TM ON (11-2).	a) None	a) (1) Ground does not receive R/T TM data, only the carrier wave from the R/T TM Xmtr.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Power for R/T TM transmission can be restored by the ground or the crew.	b) None	b) (1) Ground uses Backup R/T TM ON command (S268) to restore R/T TM, or (2) Ground requests that the crew transmit R/T TM.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS R/T TM Relay #4" (K3-292) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) Loss of power for R/T TM transmission when the ground gives the R/T TM ON command (11-2). If	a) None	a) (1) Ground does not receive R/T TM data, only the carrier wave from the R/T TM Xmtr. (2) If ground is dumping the Exp 2 Rcdr, its data is received via the R/T TM Xmtr.	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Power for R/T TM transmission can be restored by the ground or the crew.	b) None	b) (1) Ground gives the Backup R/T TM ON command (S268) to restore R/T TM. or (2) Ground requests that the crew transmi R/T TM.	b) IIIb	
	L M S	a) Reset coil fails open.	a) Power is not removed from the PCM Bus Conv and the MDA and OWS -1 and -2 Signal Conditioners when the crew returns all the Voice Record and Exp 1 switches to the "OFF" position and the R/T TM OFF (11-2) and Tape Recording - Data OFF (S377) commands are in effect.	a) None	a) After periods of time when the PCM Bus Conv has supposedly been powered-down, the Conv temperature may be slightly higher than expected.	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, other than excessive power consumption.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS R/T TM Relay #3" (K3-293) (52-79703-53) 3.2.54	L M S	a) Pole F or Pole E or Pole D fails open in the reset position.	a) None - These poles are not functional in the reset position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole F or Pole E or Pole C fails open in the latch position.	a) None. - During a normal mission, i.e., with DCS commands S454, S452 and S151 in effect, these poles serve no purpose in the latch position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
	L M S	a) (1) Pole D fails open in the latch position or (2) The latch coil fails open.	a) When the ground commands R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable DUMP (12-2), power is not supplied to Xmtr B for transmitting data from the Exp 2 Rcdr.	a) None	a) (1) The carrier wave is not received from Xmtr B. (2) The appropriate DCS verification channel indicates that the dump command has been correctly received and decoded by the DCS.	a) N/A	- - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. The problem can be overcome by the ground or the crew.	b) None	b) The ground gives the R/T TM OFF (11-2) command followed by the Back-up R/T TM ON command (S268). Exp 2 Rcdr data is transmitted on Xmtr A and R/T TM data on Xmtr B.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None. During a normal mission, i.e., with DCS commands S454, S452 and S151 in effect, this pole serves no purpose in the reset position.	a) None	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS R/T TM Relay #3" (K3-293) (52-79703-53) (Continued)	L M S	a) Reset coil fails open.	a) Whenever the ground gives the Exp 2/Data 2 Dump Enable DUMP command, power is supplied to Xmtr B as well as Xmtr A. This is no problem because generally when the Exp 2 Rcdr is being dumped, some other data is also being transmitted so that Xmtrs A & B would be powered up.	a) None	a) (1) A carrier wave is received from Xmtrs A & B. However, this may have been expected due to other commands being given along with the Exp 2 Rcdr dump command.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relays K3-292 and K3-106.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS R/T TM Relay #2" (K3-106) (52-79703-45) 3.2.55	L M S	a) Pole D fails open in the reset or latch position.	a) None. During a normal mission, i.e., with DCS commands S454, S452 and S151 in effect, this pole serves no purpose in the reset or latch position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None.	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) When the ground gives the Exp 2/Data 2 Dump Enable DUMP command (12-2), power is not supplied to Xmtr A for transmitting Exp 2 Rcdr data.	a) None	a) Carrier wave is not received from Xmtr A.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Exp 2 Rcdr data can be transmitted by Xmtr B or Xmtr C.	b) None	b) Ground switches to another Xmtr for transmitting Exp 2 Rcdr data.	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) When the ground gives the R/T TM ON command (11-2), power is not supplied to Xmtr A for transmitting R/T TM data.	a) None	a) Carrier wave is not received from Xmtr A.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. R/T TM data can be transmitted by Xmtr B or Xmtr C.	b) None	b)(1) Ground switches to another Xmtr for transmitting Exp 2 Rcdr data, or (2) Ground gives the Backup R/T TM ON command (S268). R/T TM data is received via Xmtr B.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy is provided on Pole B of Relays K3-292 and K3-293.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a)(1) When ground commands R/T TM ON (11-2) power is not supplied to Xmtr A for transmitting R/T TM data.	a) None	a) Carrier wave is not received from Xmtr A.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. R/T TM data can be transmitted by Xmtr B or Xmtr C.	b) None	b)(1) Ground switches to another Xmtr for transmitting Exp 2 Rcdr data, or (2) Ground gives the Backup R/T TM ON command (S268). R/T TM data is rec'd via Xmtr B.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS R/T TM Relay #2" (K3-106) (52-79703-45)	L M S	a) Reset coil fails open.	a) When the ground gives the R/T TM OFF command (11-2), power is not removed from Xmtr A, i.e., with S454, S452, and S151 commands in effect.	a) None	a)(1) Carrier wave is received from Xmtr A after OFF command has been given.	a) N/A	
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Power can be removed from the Xmtr.	b) None	b) Ground can remove power from the Xmtr by using the S453 command.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "DCS R/T TM Relay #1" (K3-105) (52-79715-13) 3.2.56	L M S	a)(1) Pole B fails open when the coil is energized, or (2) The coil fails open.	a) Relays K3-106, K3-293 and K3-292 cannot be cycled to the latch position to carry out the R/T TM ON (11-2) command.	a) None	a) The carrier wave is not received from the R/T TM Xmtr (normally Xmtr A).	a) N/A	---
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. The ground can use the Backup R/T TM DCS channels (S268/S269).	b) None	b)(1) The ground gives the Backup R/T TM ON (S268) command. R/T TM data is received from Xmtr B, or (2) Ground requests that the crew manually transmit R/T TM data.	b) IIIb	
	L M S	a)(1) Pole A fails open when the coil is energized, or (2) The coil fails open.	a)(1) Relays K3-106, K3-293 and K3-292 cannot be cycled to the reset position. Power is not removed from the TM Xmtr (normally Xmtr A) when the R/T TM OFF (11-2) command is given. (2) Ground will be unable to dump the Exp 2 Rcdr simultaneously with Data & Voice or Exp 1 & Exp Voice.	a) None.	a)(1) Carrier wave is received from the R/T TM Xmtr after the R/T TM OFF command is given. (2) Ground observes that they do not receive Exp 2 Rcdr data when they attempt to dump it simultaneously with Data and Voice or Exp 1 and Exp Voice.	a) N/A	---
		b)(1) Insulating film on contacts due to contamination.	b) None. Ground and/or crew working together can overcome the data transmission problem.	b) None	b)(1) Ground uses the S453 command to remove power from Xmtr A. (2) Ground requests that the crew manually dump the Rcdrs when they desire to receive Exp 2 data simultaneously with Data & Voice or Exp 1 and Exp Voice.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #4" (K3-296) (52-79703-61) 3.2.57	M	a) Pole F fails open in the reset position.	a)(1) Power is not supplied to the MDA, AM and OWS Voice Record lights (green) when the crew switches one of the Voice Record switches to the "RECORD" position. (2)If the crew is recording Voice when the ground gives the Data Dump Enable ON (6-1) and Data Rcdr Dump Execute DUMP (15-2) commands, the Voice Record lights do not extinguish. Crew does not realize they are not recording Voice because ground is dumping the Data Rcdr.	a) The Voice Record lights do not come ON when the crew switches one of the Voice Record switches to the RECORD position.	a)(1) Data Rcdr tape motion monitor channel (normally K508) indicates the Rcdr had tape motion at the time the crew switched a Voice Record switch to the "RECORD" position.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, other than an inconvenience. Voice Record lights are only an indicator.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b)(1) Ground coordinates with the crew in determining whether a change in operating procedures is necessary due to the loss of Voice Record lights. (2) Ground informs the crew whenever they dump the Data Recorder.	b) IIIb	
	M	a) Pole F fails open in the latch position.	a) If the crew is recording Voice when the ground gives the Data & Voice Dump Enable ON (16-2) and Data Rcdr Dump Execute DUMP (15-2) commands, the Voice Record lights do not extinguish. Crew does not realize they are not recording Voice because the ground is dumping the Data Rcdr.	a) The Voice Record lights are ON even though the DCS dump/execute command has placed the Rcdr in the playback mode rather than the record mode.	a) Examination of the Voice data indicates there is a discrepancy.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, other than an inconvenience. Voice Record lights are only an indicator.	b) (1) None.	b)(1) Ground informs the crew that recorded Voice appears questionable and aids crew in troubleshooting to determine the cause of the trouble.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a)(1) If failure occurs when the PCM Bus Conv is powered-down, power is not applied to the Conv. when the R/T TM ON command (11-2) is given. Conv. is powered up for any other DCS or manual command requiring PCM Bus pwr.	a) None	a)(1) R/T TM data is not received only the Xmtr carrier wave. (2) The temperature of the PCM Bus Conv may be slightly higher than expected after periods of time when the Conv. has supposedly been powered-down.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #4" (K3-296) (52-79703-61) (Continued)	L M S	a) (Cont'd.)	a)(2) Power is not removed from the PCM Bus Conv. when the ground commands R/T TM OFF (11-2), Data and Voice Dump Enable OFF (16-2), Data Dump Enable OFF (6-1), Data Record OFF (S377) and the crew switches all the Voice Record, Exp 1 and Exp 2 switches to the OFF position.	a) None		a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) None. Ground can use the Backup R/T TM command to obtain R/T TM data. (2) None, other than excessive power consumption unless the ground detects that the Conv. is continuously powered-up.	b) None	b)(1) Ground uses the Backup R/T TM ON command (S268) to obtain R/T TM data. (2) Ground can remove power from the PCM Bus Conv. by momentarily using the PCM Bus Select commands (S274/S275) when Bus A and Bus B are not being used.	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) Power is not applied to the PCM Bus Conv. when the ground commands Data and Voice Dump Enable ON (16-2).	a) None	a)(1) Data and Voice are not received from the Data Rcdr	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground can obtain necessary power for the Data and Voice dump.	b) None	b)(1) Ground uses the Data Dump Enable ON command (6-1) with the Data and Voice Dump Enable ON command (16-2). This powers the PCM Bus Conv. Ground then gives Data Dump Enable OFF command (6-1), Conv. stays powered-up.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) The Data Rcdr power relays do not cycle to the reset (OFF) position when Rcdr is commanded OFF. Data Rcdr is powered-up whenever the PCM Bus Conv. is powered-up.	a) If the end-of-tape is reached, the Data Rcdr "STOP" light (on Panel 204) comes ON.	a)(1) The Data rcdr tape motion monitor channel indicates the Data Rcdr is operating whenever the PCM Bus Conv is powered-up. (2) Appropriate DCS verification channel indicates commands have been correctly received and decoded by the DCS.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #4" (K3-296) (52-79703-61) (Continued)	L M S	b) Insulating film on contacts due to contamination.	b) None. Crew or ground can remove power from the affected Rcdr.	b)(1) Crew informs ground of the anomaly.	b)(1) The ground requests that the crew manually remove power from the Data Rcdr. (2) When Rcdrs are all commanded OFF, ground can reset the affected relays by momentarily using the FCM Bus Select commands (S274/S275)	b) IIIb	
	M	a) Pole D fails open in the latch position.	a) When the ground gives the Data and Voice Dump Enable ON command (16-2), the Data Rcdr power relays do not cycle to the latch position. Power is not supplied to the Data Rcdr.	a) None.	a)(1) Data and Voice are not received from the Data Rcdr (2) The Data Rcdr tape motion monitor channel (normally K508) indicates there is no tape motion. (3) Appropriate DCS verification channel indicates the dump command has been correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still dump Data and Voice.	b) None.	b)(1) Ground gives the Data Dump Enable ON command (6-1) along with the Data & Voice Dump Enable ON command. This cycles Data Rcdr power relays to the latch position. Ground then gives Data Dump Enable OFF command, relays remain in the latch position. Data and Voice are received.	b) IIIb	
	L M S	a) Pole C falls open in the reset position.	a) When the ground commands R/T TM ON (11-2) and Exp 2 Dump Enable ON (12-2), there is a loss of the Exp 2 Rcdr data output (Channel A) to the TM Xmtr.	a) None.	a)(1) Exp. 2 Rcdr data is not received by the ground, only the Xmtr's carrier wave is received. (2) The Exp 2 Rcdr tape motion monitor indicates there is tape motion. (3) Appropriate DCS verification channel indicates dump command has been correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit R/T TM and Exp 2 Rcdr data.	b) None.	b)(1) Ground uses the Backup R/T TM ON command (S268) and the Exp 2 Dump Enable ON command (12-2) when R/T TM and Exp 2 Rcdr data are desired.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #4" (K3-296) (52-79703-61) (Continued)	M	a) Pole C fails open in the latch position.	a) When the ground commands Data and Voice Dump Enable ON (16-2), there is a loss of the Data Rcdr voice output (Channel B) to the TM Xmtr.	a) None	a)(1) Ground does not receive Voice from the Data Rcdr.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Ground cannot dump Voice from the Data Rcdr. Crew can manually dump Voice from the Data Rcdr.	b) None	b) Ground requests that the crew manually dump voice from the Data Rcdr.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy provided by Pole B of Relays K3-297 and K3-104.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None.	b) None	b) None	b) IIIb	
	M	a) Reset coil fails open.	a) When the ground gives the Data and Voice Dump Enable OFF command (16-2), power is not removed from the PCM Bus Conv. and the Data Rcdr.	a) If the end-of-tape is reached, the Data Rcdr "STOP" light (on Panel 204) comes ON.	a)(1) If R/T TM is ON, the Data Rcdr tape motion monitor channel indicates there is tape motion. (2) Appropriate DCS verification channel indicates command has been correctly received and decoded by the DCS. (3) The temperature of the PCM Bus Conv. may be slightly higher than expected after periods of time when the Conv. has supposedly been powered-down.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) During storage periods, there will be a loss of recorded Prime Data (subframe 1) since the Data Rcdr will be manually configured OFF.	b)(1) Crew informs ground of the anomaly. (2) If deemed necessary, crew can remove power from the PCM Bus Conv. by opening its circuit breaker.	b)(1) Ground requests that the crew manually remove power from the Data Rcdr. (2) Ground instructs crew as to what Tape Rcdr configuration will be used prior to storage periods.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data and Voice Dump Relay #4" (K3-296) (52-79703-61) (Continued)	M	a) Latch coil fails open.	a) When the ground gives the Data and Voice Dump Enable ON command (16-2), power is not supplied to the PCM Bus Conv and/or the Data Rcdr.	a) None	a)(1) Ground does not receive Data and Voice from the Data Rcdr. (2) If R/T TM is being transmitted, the Data Rcdr tape motion monitor channel (normally K508) indicates no tape motion. The appropriate DCS verification channel indicates the dump command has been correctly received and decoded by the DCS.	a) N/A	---
		b) Defective wire or terminal due to contamination.	b) None. Crew can manually dump Data and Voice from the Data Rcdr.	b) None.	b) Ground requests that the crew manually dump Data and Voice from the Data Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #3" (K3-297) (52-79703-53) 3.2.58	L M S	a) Pole F or Pole E or Pole D fails open in the reset position.	a) None - These poles are not functional in the reset position.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole F or Pole D or Pole C fails open in the latch position.	a) None. During a normal mission i.e. with DCS commands S454, S452, and S151 in effect, these poles serve no function in the latch position.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) When the ground gives the Data & Voice Dump Enable ON command (16-2), power is not supplied to Xmtr C for Transmitting Data (Subframe 1).	a) None.	a) 1. Carrier wave is not received from Xmtr C. Voice is received from Xmtr B. 2. If R/T TM is ON, appropriate DCS verification channel indicates the commands have been correctly received & decoded by the DCS.	a) N/A	
		b) Insulating film on contacts due to contamination	b) None. Data & Voice can still be dumped by the ground or the crew.	b) None.	b) 1. Ground gives the Data Dump Enable ON (6-1) and Data & Voice Dump Enable ON (16-2) command. This restores power to Xmtr C, or 2. Ground switches to Xmtrs A and B for transmitting Data & Voice from the Data Rcdr, or 3. Ground requests that the crew manually dump Data and Voice.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #3" (K3-297) (52-79703-53)	L M S	a) Pole C fails open in the reset position.	a) None. During a normal mission, i.e. with DCS commands S454, S452 and S151 in effect, this pole serves no function in the reset position.	a) None.	a) None.	a) N/A	-----
3.2.58		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Relays K3-296 and K3-104.	a) None.	a) None.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Latch coils fails open.	a) When the ground gives the Data & Voice Dump Enable ON command (16-2), power is not supplied to TM Xmttr C.	a) None.	a) (1) Carrier wave is not received from Xmtr C. Voice is received from Xmtr C. (2) If R/T TM is ON, appropriate DCS verification channel indicates the commands have been correctly received and decoded by the DCS.	a) N/A	-----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Data & Voice can be dumped by the crew.	b) None.	b) (1) Ground requests that the crew manually dump Data and Voice.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data and Voice Dump Relay #3" (K3-297) (52-79703-53) (Continued)	M	a) Reset coil fails open.	a) When the ground gives the Data & Voice Dump Enable OFF command (16-2), power is not removed from TM Xmtr C.	a) None.	a) (1) Carrier wave is received from Xmtr C.	a) N/A	-----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Power can be removed from the Xmtr by changing to manual control of the Xmtrs. DCS commands can only determine which Xmtr will be continuously powered-up.	b) None.	b) (1) Ground requests that the crew manually control the TM Transmitters. (2) For storage, the ground may choose to have crew open the circuit breaker for Xmtr C, or ground may use the S150, S153 and S195 DCS commands so that power is continuously applied to the 2-watt Xmtr instead of the 10-watt Xmtr. This conserves power and reduces the probability of a 10-watt Xmtr failure.		
	L M S	a) Pble A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None	a) N/A	-----
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #2" (K3-104) (52-79703-53) 3.2.59	L M S	a) Pole F or Pole D fails open in the reset position.	a) None. During a normal mission i.e., with DCS commands S454, S452 and S151 in effect, these poles serve no function in the reset position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole F fails open in the latch position.	a) When the ground gives the Data and Voice Dump Enable ON (16-2) and Data Rcdr Dump Execute DUMP (15-2) commands, the playback (PB) signal is not supplied to the Data Rcdr.	a) None	a)(1) Data and Voice are not received from the Data Rcdr, only the carrier wave from the TM Xmtrs which are designated for transmission of Data and Voice. (2) If R/T TM is ON, the Data Rcdr tape motion monitor channel indicates there is tape motion, and the appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still dump Data and Voice.	b) None	b)(1) Ground gives the Data Dump Enable ON command (6-1) along with the Data and Voice Dump Enable ON command (16-2). This restores the PB command, or (2) Ground requests that the crew manually dump Data and Voice.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a)(1) When the ground commands R/T TM ON (11-2) and Exp 2 Dump Enable ON (12-2), power is not supplied to Xmtr B for transmitting Exp 2 Rcdr output.	a) None	a)(1) Carrier wave is not received from Xmtr B. (2) Exp 2 Rcdr tape motion monitor channel indicates there is tape motion. (3) Appropriate DCS verification channel indicates the commands were correctly received and decoded by the DCS.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #2" (K3-104) (52-79703-53) (Continued)	L M S	b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still control transmission of R/T TM and Exp 2 Rcdr data.	b) None	b)(1) Ground switches to a different Xmtr for transmitting Exp 2 Rcdr data, or (2) Ground uses Backup R/T TM (S268) and Exp 2 Dump Enable ON (12-2) commands, or (3) Ground requests that the crew manually control the transmission of R/T TM and Exp 2 Rcdr data.	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) When the ground commands Data and Voice Dump Enable ON (16-2), power is not supplied to Xmtr B for transmitting the Voice output of the Data Rcdr.	a) None	a)(1) Carrier wave is not received from Xmtr B. (2) If R/T TM is ON, appropriate DCS verification channel indicates command has been correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still control transmission of Data and Voice from the Data Rcdr.	b) None	b)(1) Ground switches to Xmtr A for Voice transmission, or (2) Ground requests that the crew manually transmit Data and Voice from the Data Rcdr.	b) IIIb	
	L M S	a) Pole D fails open in the latch position.	a) None. Pole D is not functional in the latch position	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset or latch position.	a) None - Pole C is a spare.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Latch coil fails open.	a) When ground gives the Data & Voice Dump Enable ON (16-2) and Data & Voice Dump Execute DUMP (15-2) commands, power is not supplied to TM Xmtr B and the playback signal is not supplied to the Data Rcdr.	a) None	a)(1) Ground does not receive a carrier wave from Xmtr B (for Voice) or Data from Xmtr C. Only the carrier wave is received from Xmtr C.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #2" (K3-104) (52-79703-53) (Continued)	M	a) (cont'd.)			a)(2) If R/T TM is ON, the Data Rcdr tape motion monitor channel indicates no tape motion and the appropriate DCS verification channel indicates the commands have been correctly received and decoded by the DCS.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground or crew can still dump Data & Voice.	b) None.	b)(1) Ground switches to Xmtrs A and C for Data and Voice and uses the Data Dump Enable ON (6-1) and Data and Voice Dump Enable ON (16-2) commands for dumping Data & Voice, or (2) Ground requests that the crew manually dump Data & Voice.	b) IIIb	
	M	a) Reset coil fails open.	a) When the ground gives the Data and Voice Dump Enable OFF (16-2) command, power is not removed from TM Xmtr B.	a) None	a)(1) Ground continues to receive carrier wave from Xmtr B. (2) If R/T TM is ON, the Data Rcdr tape motion monitor channel indicates no tape motion unless Rcdr is recording Data and/or Voice and the appropriate DCS verification channel indicates the command has been correctly received and decoded by the DCS.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can remove power from Xmtr B.	b) None	b)(1) Ground switches to Xmtrs A and C for Data & Voice transmission. This can be accomplished with S453 command. It removes power from Xmtr B. (2) Alternate - Ground request that the crew manually reconfigure the Xmtrs.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy provided on Pole B of Relays K3-296 and K3-297.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Data & Voice Dump Relay #2" (K3-104) (52-79703-53) (Continued)	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "DCS Data & Voice Dump Relay #1" (K3-103) (52-79715-13) 3.2.60	M	a)(1) Pole B fails open when coil is energized, or (2) Coil fails open with Relays K3-104, K3-296 and K3-297 in the reset position.	a) When the ground gives the Data and Voice Dump Enable ON (16-2) and Data Rcdr Dump Execute DUMP (15-2) commands, power is not applied to the PCM Bus Conv, the Data Rcdr and TM Xmtrs B and C.	a) None	a)(1) Carrier wave is not received from Xmtrs B and C. (2) If R/T TM is ON (PCM Bus Conv will be powered-up.), the Data Rcdr tape motion monitor channel indicates no tape motion and appropriate DCS verification channels indicate commands have been correctly received and decoded by the DCS.	a) N/A	---
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew can manually transmit Data and Voice.	b) None	b)(1) Ground requests that the crew manually transmit Data and Voice.	b) IIIb	
	M	a)(1) Pole A fails open when the coil is energized, or (2) Coil fails open with Relays K3-104, K3-296 and K3-297 in the latch position.	a)(1) When ground gives the Data Recorder Dump Execute OFF (15-2) and Data & Voice Dump Enable OFF (16-2) commands, power is not removed from the PCM Bus Conv, the Data Rcdr, and TM Xmtrs B and C.	a) None	a)(1) Ground continues to receive carrier wave from Xmtrs B and C. (2) If R/T TM is ON, the Data Rcdr tape motion monitor channel indicates there is tape motion and appropriate DCS verification channels indicate commands have been correctly received and decoded by the DCS.	a) N/A	---
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) To prevent continuous application of power to the Rcdrs, they must be manually switched OFF prior to storage phases. This results in a loss of recorded data during storage.	b)(1) Upon ground direction, crew manually controls the Tape Rcdrs and TM Xmtrs.	b)(1) Ground requests that the crew manually remove power from the Tape Rcdrs and the TM Xmtrs. (2) During storage periods, ground can configure the Xmtrs so that the continuous application of power will be to the 2-watt Xmtr and to either Xmtr B or C.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp.1 & Exp Voice Dump Relay #4" (KJ-294) (52-79703-61) 3.2.61	M	a) Pole F fails open in the reset position.	a) The Exp 1 Rcdr power relays do not reset when all commands requiring Exp 1 Rcdr power are OFF. Power is supplied to the Exp. 1 Rcdr whenever the Exp Rcdr Conv is powered-up.	a) If the end-of-tape is reached, the Exp 1 Rcdr "STOP" light (located on Panel 204) comes ON.	a)(1) When the Exp 1 and Exp Voice Dump Enable OFF command (10-2) is given, if R/T TM is ON, the Exp 1 tape motion monitor channel indicates there is tape motion. (2) The appropriate DCS verification channel indicates the command has been correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can remove power from the Rcdr.	b)(1) Crew informs ground of observed anomaly.	b)(1) Ground requests that the crew manually remove power from the Exp 1 Rcdr, or (2) Ground can momentarily use the PCM Bus Select commands (S274/S275) to reset the affected relays.	b) IIIb	
	M	a) Pole F fails open in the reset position.	a) When the ground gives the Exp 1 and Exp Voice Dump Enable ON command (10-2), power is not supplied to the Exp 1 Rcdr.	a) None	a)(1) Ground does not receive Exp 1 Data and Exp Voice, only the carrier waves from the TM Xmtrs which are designated to transmit Exp 1 Data and Exp Voice. (2) If R/T TM is ON, the Exp 1 Rcdr tape motion monitor channel indicates no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew can dump the Exp 1 Rcdr.	b) None	b) Ground requests that the crew manually dump Exp 1 data and Exp Voice.	b) IIIb	
	L M S	a) Pole A fails open in the reset and latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1 & Exp Voice Dump Relay #4" (K3-294) (52-79703-61) (Continued)	M	a) Pole E fails open in the reset position.	a) Power is not removed from the Exp Rcdr Conv when the Exp Rcdrs are turned OFF.	a) None	a)(1) The Exp Rcdr Bus voltage monitors (normally M520, M521 and M522) indicate the Exp Rcdr Conv is powered-up. (2) The appropriate DCS verification channels indicate that commands have been correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground can remove power from the Conv.	b) None	b)(1) When all Bus A and Bus B functions are turned OFF, ground can remove power from the Exp Rcdr Conv by momentarily using the PCM Bus Select commands (S274/S275).	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) When the ground gives the Exp 1 and Exp Voice Dump Enable ON command, power is not applied to the Exp Rcdr Conv.	a) None	a)(1) Exp 1 data and Exp Voice are not received, only the carrier waves from the TM Xmtrs which are designated to transmit Exp 1 data and Exp Voice. (2) If R/T TM is ON, the Exp Rcdr Bus voltage monitor channels (normally M520, M521 and M522) indicate zero volts. (3) Appropriate DCS verification channels indicate the command has been correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can still dump the Exp 1 Rcdr.	b) None	b)(1) Ground uses the Exp 2/Data 2 Dump Enable ON (12-2) command along with the Exp 1 and Exp Voice Dump Enable ON command. This applies power to the Exp. Rcdr Conv, then the Exp 2/Data 2 Dump Enable OFF command is given. Exp Rcdr Conv remains powered-up, or (2) Ground requests that the crew dump the Exp 1 Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1 & Exp Voice Dump Relay #4" (K3-294) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a)(1) When the ground gives the R/T TM ON (11-2) and the Exp 2/Data 2 Dump Enable ON (12-2) commands, there is a loss of the Exp 2 Rcdr data output (Channel A) to the TM Xmtr. (2) When the ground gives the Data and Voice Dump Enable ON command (16-2), there is a loss of the Data Rcdr Voice output (Channel B) to the TM Xmtr. The data output (Channel A) is not affected.	a) None	a)(1) Ground does not receive Exp 2 Rcdr data. The Xmtr carrier wave is received. The Exp 2 Rcdr tape motion monitor channel indicates there is tape motion. (2) Ground does not receive Voice from the Data Rcdr. Only the carrier wave is received. If R/T TM is ON, appropriate DCS verification channel indicates command is correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can dump the Rcdrs and obtain Exp 2 data or Voice.	b) None	b)(1) Ground uses the Backup R/T TM ON (S268) and Exp 2/Data 2 Dump Enable ON (12-2) commands. Correct data is received. (2) Ground requests that the crew manually dump Data & Voice from the Data Rcdr.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) When the ground commands Exp 1 and Exp Voice Dump Enable ON (10-2), there is a loss of the Exp 1 Rcdr Voice output (Channel B) to the TM Xmtr.	a) None	a)(1) There is a loss of Exp Voice. The Xmtr carrier wave is received.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew can dump Exp 1 data and Exp Voice.	b) None	b)(1) Ground requests that the crew manually dump Exp 1 data and Exp Voice.	b) IIIb	
	M	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relays K3-295 and K3-101.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Reset coil fails open.	a) When the ground gives the Exp 1 and Exp Voice Dump Enable OFF command (10-2), power is not removed from the Exp Rcdr Conv and the Exp 1 Rcdr. Ground cannot dump Voice from the Data Rcdr. Ground can dump Data only by using the Data Dump Enable ON (6-1) and the Exp 1 and Exp Voice Dump Enable OFF (10-2) commands.	a) None	a)(1) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 and M522) indicate the Exp Rcdr Conv is powered-up continuously.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1 & Exp Voice Dump Relay #4" (K3-294) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) During storage periods, the Rcdrs will be in the manual control mode, thus the ground cannot reconfigure the Rcdrs in the event of a failure.	b) None	b)(1) Ground requests that the crew manually control the Tape Recorders.	b) IIIb	
	M	a) Latch coil fails open.	a) When the ground gives the Exp 1 and Exp Voice Dump Enable ON command (10-2) power is not supplied to the Exp Rcdr Conv or the Exp 1 Rcdr. Ground cannot use other commands to restore power to the Exp 1 Rcdr.	a) None	a)(1) Ground does not receive Exp 1 data or Exp Voice. Ground receives only the carrier waves from the TM Xmtrs.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. The crew can manually dump the Exp 1 Rcdr.	b) None	b) Ground requests that the crew manually control the dumping of Exp 1 data and Exp Voice.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1 and Exp Voice Dump Relay #3" (K3-295) (52-79703-53) 3.2.62	L M S	a) Pole F or Pole D fails open in the reset or latch position.	a) During a normal mission, i.e., with DCS commands S151, S452 and S454 in effect, Pole D and Pole F are not functional.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) When the ground gives the Data Dump Enable ON (6-1) or Data and Voice Dump Enable ON (16-2) command, power is not supplied to TM Xmtr C.	a) None	a)(1) Ground does not receive Data Rcdr data (Channel A). Carrier wave is not received from Xmtr C. (2) If R/T TM is ON, the Data Rcdr tape motion monitor channel (normally K508) indicates there is tape motion. Appropriate DCS verification channel indicates the command has been correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can still dump the Data Rcdr.	b) None	b)(1) Ground switches to Xmtr A for transmission of Data Rcdr data (Channel A), or (2) Ground requests that the crew manually dump the Data Rcdr.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B of Relays K3-294 and K3-101.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) When the ground commands Exp 1 and Exp Voice Dump Enable ON (10-2), power is not supplied to TM Xmtr C.	a) None	a)(1) Ground does not receive Exp 1 Rcdr data (Channel A) The carrier wave is not received from Xmtr C. Exp Voice is not affected.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still dump Exp 1 and Exp Voice.	b) None	b)(1) Ground switches to TM Xmtr A for Exp 1 Rcdr data (Channel A), or (2) Ground requests that the crew manually transmit Exp 1 and Exp Voice.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1 and Exp Voice Dump Relay #3" (K3-295) (52-79703-53) (Continued)	L M S	a) Pole C fails open in the reset position.	a) When ground commands R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2), power is not supplied to TM Xmtr B.	a) None	a) Ground does not receive Exp 2 Rcdr data (Channel A). The carrier wave is not received from Xmtr B.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still dump desired data.	b) None	b)(1) Ground uses Backup R/T TM ON (S268) and Exp 2/Data 2 Dump Enable ON (12-2) commands, or (2) Ground requests that the crew manually transmit desired data.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) When the ground commands Exp 1 and Exp Voice Dump Enable ON (10-2), power is not supplied to Xmtr B.	a) None	a) Ground does not receive Exp Voice. The carrier wave is not received from Xmtr B.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still dump desired data.	b) None	b)(1) Ground switches to TM Xmtr A for Exp Voice, or (2) Ground requests that the crew manually transmit desired data.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None.	b) None	b) None	b) IIIb	
	M	a) Latch coil fails open.	a) When the ground gives the Exp 1 and Exp Voice Dump Enable ON command (10-2), power is not supplied to TM Xmtrs B and C.	a) None	a)(1) Exp 1 data and Exp Voice are not received. Carrier wave is not received from TM Xmtrs B and C. (2) If R/T TM is ON, the Exp 1 Rcdr tape motion monitor channel indicates there is tape motion.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. The crew can transmit Exp 1 data and Exp Voice.	b) None	b)(1) Ground requests that the crew manually dump Exp 1 data and Exp Voice.	b) IIIb	
	M	a) Reset coil fails open.	a) When the ground gives the Exp 1 and Exp Voice Dump Enable OFF command (10-2), power is not removed from TM Xmtrs B and C.	a) None	a)(1) Ground continues to receive the carrier wave from Xmtrs B and C.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1 and Exp Voice Dump Relay #3" (K3-295) (52-79703-61)		a) Continued			a)(2) If R/T TM is ON, appropriate DCS verification channel indicates the command has been correctly received and decoded by the DCS.	a) N/A	---
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. During manned phases, the crew can remove power from the Xmtrs. During unmanned phases, two of the Xmtrs will be continuously powered-up.	b) None	b)(1) Ground requests that the crew remove power to the Xmtrs by assuming manual control of the Xmtrs. (2) During storage, ground will have DCS control of Xmtrs. Ground can configure Xmtrs so that one of the two powered-up Xmtrs is the 2-Watt Xmtr. This reduces the probability of a 10-watt Xmtr failure due to continuous power application.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1 & Exp Voice Dump Relay #2" (K3-101) (52-79703-53) 3.2.63	L M S	a) Pole F fails open in the reset or latch position.	a) None - Pole F is a spare.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) Loss of power to reset Relays K3-298 and K3-255 when the ground commands Exp 1 & Exp Voice Dump Enable OFF (10-2) but leaves the Data Dump Enable ON command (6-1) in effect. The Data Xmtr (normally Xmtr A) remains powered-up.	a) None	a) (1) Ground continues to receive the carrier wave from the Data Xmtr (normally Xmtr A). (2) If ground commands R/T TM ON (11-2), data is not received. (3) If ground commands Exp 2/ Data 2 Dump Enable ON followed by the correct Execute command, data is not received from the Exp 2 Rcdr. (4) If Backup R/T TM ON command (S268) is given, data is received.		
		b) Insulating film on contacts due to contemination.	b) None. Ground can reset the affected relays to remove power from Xmtr A.	b) None	b) (1) Ground commands Data Dump Enable OFF (6-1) followed by the Exp 1 & Exp Voice Dump Enable OFF command (10-2). This resets Relays K3-298 and K3-255.	b) IIIb	
	L M S	a) Pole D or Pole C fails open in the reset or latch position.	a) None. During a normal mission, i.e. with DCS commands S151, S452, and S454 in effect, these poles are not functional.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy is provided by Pole B of Relays K3-294 and K3-295.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "DCS Exp 1 & Exp Voice Dump Relay #2" (K3-101) (52-79703-53) (continued)	M	a) Pole E fails open in the latch position.	a) Loss of power to reset Relays K3-298 and K3-255 when the ground commands Data Dump Enable OFF (6-1) but leaves the Exp 1 & Exp Voice Dump Enable ON command (10-2) in effect. The Data Xmtr (normally Xmtr A) remains powered-up.	a) None	a) (1) Ground continues to receive the carrier wave from the Data Xmtr (normally Xmtr A). (2) If ground commands R/T TM ON (11-2), data is not received. (3) If ground attempts to dump the Exp 2 Rcdr, data is not received. (4) If Backup R/T TM ON command (S268) is given, data is received.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Ground can reset the affected relays to remove power from Xmtr A.	b) None	b) (1) Ground commands Exp 1 & Exp Voice Dump Enable OFF (10-2). This resets Relays K3-298 and K3-255.	b) IIIb	
	M	a) Latch coil fails open.	a) If ground commands Exp 1 & Exp Voice Dump Enable ON (10-2) and Data Dump Enable ON (6-1), there is a loss of power to latch Relays K3-298 and K3-255. Power is not supplied to the Data Xmtr (normally Xmtr A).	a) None	a) Carrier wave is not received from the Data Xmtr (normally Xmtr).	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Ground cannot dump the Data Rcdr and Exp 1 Rcdr at the same time. Crew can still dump both Rcdrs at the same time.	b) None	b) (1) Ground does not attempt to dump the Data Rcdr and Exp 1 Rcdr at the same time, Or (2) Ground requests that the crew manually dump Data, Exp 1 & Exp Voice.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "DCS Exp 1 & Exp Voice Dump Relay #2" (K3-101) (52-79703-53) (continued)	M	a) Reset coil fails open.	a) With Relay K3-101 in the Latch position, Relays K3-298 and K3-255 cycle to the latch position each time the Data Dump Enable ON command (6-1) is given. This applies power to Xmtrs A & C and the Data Rcdr data output (Channel A) will be supplied to Xmtrs A & C. This results in a reduction of the Data Rcdr data signal strength at the Xmtrs. Also, the ground cannot use the R/T TM ON (11-2) or Exp 2/ Data 2 Dump Enable ON (6-1) command along with the Data Dump Enable ON command.	a) None	a) (1) If ground gives the R/T TM ON or Exp 2/ Data 2 Dump Enable ON command followed by the proper Execute commands, ground receives Data Rcdr data from Xmtr A and Xmtr C but does not receive R/T TM or Exp 2 Rcdr data. (2) If ground dumps Data (not Data & Voice) from the Data Rcdr, Data is received from Xmtr A and Xmtr C. As with the above indication, the Data signal strength is reduced.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. The ground can still dump Data although some revision of the dump schedule may be necessary. Also, the crew can dump the Data Rcdr with no problems.	b) None	b) (1) To achieve full signal strength, ground uses the Data & Voice Dump Enable ON command (16-2) when they wish to dump Data, Or (2) Ground requests that the crew manually dump the Data Rcdr.	b)	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "DCS Exp. 1 & Voice Dump Relay #1" (K3-100) (52-79715-13) 3.2.64	M	a) (1) Pole B fails open when the coil is energized, or (2) The coil fails open with Relays K3-101, -295, and -294 in the reset position.	a) Ground cannot dump the Exp 1 recorder by using DCS commands	a) None	a) When the ground attempts to dump the Exp 1 recorder, Exp 1 and Voice are not received nor are the carrier waves from the Xmtrs. R/T TM indicates the Exp 1 recorder has no tape motion unless the crew is recording Exp 1 data. Appropriate DCS verification channel indicates commands have been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. The crew can manually dump the Exp 1 Recorder.	b) None.	b) (1) Ground requests that the crew manually dump the Exp 1 Recorder.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "DCS Exp. 1 and Voice Dump Relay #1" (K3-100) (52-79715-13) (Continued)	M	a) (1) Pole A fails open when the coil is energized, or (2) The coil fails open with Relays K3-101, -295 and -294 in the latch position.	a) (1) When the ground gives the Exp. 1 and Voice Dump Enable OFF command (10-2), power is not removed from two TM Xmtrs (normally xmtrs B & C), the Exp 1 Recorder, and the Exp Rcdr Conv. (2) Ground cannot dump Voice from the Data Rcdr.	a) If end-of-tape is reached, the Exp 1 Rcdr "STOP" light (on Panel 204) comes ON.	a) (1) Ground continues to receive carrier waves from Xmtrs B & C. (2) Ground does not receive Voice when the Data and Voice Dump Enable ON command (16-2) is given. (3) R/T TM indicates that the Exp 1 Rcdr. has tape motion and the Exp Rcdr Bus voltage monitor indicates the Exp Rcdr Conv is powered up. Appropriate DCS verification channel indicates the Dump Enable OFF command has been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) During storage periods, the ground may not be able to control the configuration of the Tape Rcdr as the Rcdrs may be in the manual mode to provide continuous power application. Two of the TM Xmtrs will be powered up continuously during storage.	b) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually remove power from the Exp 1 Rcdr. (2) Ground requests that the crew manually control the TM Transmitters. (3) During storage, the ground may configure the Xmtrs so that power is applied to the 2-watt Xmtr and either Xmtr B or C to reduce the probability failure of a 10-watt Xmtr due to continuous operation.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "DCS Exp. 1, Exp Voice and Data Dump Relay #3" (K3-298) (52-79703-61) 3.2.65	L M S	a) Pole F or Pole E or D fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	- - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) (1) When the ground gives the Exp 2/Data 2 Dump Enable ON command, there is a loss of the Exp 2 Rcdr data output (Channel A) to the TM Xmtr (2) When the ground gives the R/T TM ON command (11-2), there is a loss of the R/T TM data signal to the TM Xmtr. (3) When the R/T TM ON and Exp 2/Data 2 Dump Enable ON commands are given, there is a loss of the R/T TM data signal to the TM Xmtr.	a) None	a) (1) Ground does not receive data from the Exp 2 Rcdr., only the Xmtr carrier wave is received. (2) R/T TM data is not received, only the Xmtr carrier wave is received. (3) Exp 2 Rcdr data is received. R/T TM data is not received, only the Xmtr carrier wave is received.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None. R/T TM data and Exp 2 Rcdr data can still be obtained by DCS commands.	b) None	b) (1) Ground uses the backup R/T TM command (S268) to obtain R/T TM data. (2) Ground must use R/T TM ON and Exp 2/Data 2 Dump Enable ON in order to dump the Exp 2 Rcdr. (3) Ground can request that the crew manually transmit desired data.	b) N/A	- - - - - - - - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1, Exp Voice and Data Dump Relay #3" (K3-298) (52-79703-61) (Continued)	M	a) (1) Pole C fails open in the latch position, or (2) Latch coil fails open.	a) When the ground attempts to dump Data, Exp 1 and Exp Voice simultaneously from the Rcdrs, there is a loss of the Data Rcdr data ouput (Channel A) to the TM Xmtr (normally Xmtr C).	a) None	a) The ground does not receive data from Xmtr designated for Data Transmission, only the carrier wave is received. Exp 1 and Exp Voice are not affected.	a) N/A	- - - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress	b) None. Crew can manually dump Exp 1 and Exp Voice when the Data Rcdr is being dumped.	b) None	b) (1) Ground requests that the crew manually transmit Data, Exp 1 and Exp Voice, or (2) Crew does not dump Exp 1 and Exp Voice at the same time that they are dumping data.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relay K3-255.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1, Exp Voice and Data Dump Relay #3" (K3-298) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) The relay cannot be cycled to the reset position. When the ground gives the R/T TM ON command (11-2) there is a loss of the R/T TM signal to the TM Xmtr or when the ground gives the Exp 2/Data 2 Dump Enable ON command (12-2) there is a loss of the Exp 2 Rcdr data ouput (Channel A) to the TM Xmtr.	a) None	a) The ground does not receive R/T TM data or the ground does not receive data from the Exp 2 Rcdr. Only the Xmtr carrier wave is received.	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground or crew can still control transmission of the desired data.	b) None	b) (1) The ground gives the Backup R/T TM ON command (S268). R/T TM data is received. (2) Ground can dump the Exp 2 Rcdr by using the R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2) commands. Only Exp 2 Rcdr data will be received. (3) Ground can request that the crew manually control the transmission of R/T TM and/or Exp 2 Rcdr data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1, Exp Voice and Data Dump Relay #2" (K3-255) (52-79703-53) 3.2.66	L M S	a) Pole F or Pole E fails open in the reset or latch position.	a) None. During a normal mission, i.e. with DCS Commands S151, S452 and S454 in effect, these poles are not functional.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) When the ground commands R/T TM ON (11-2) or Exp 2/Data 2 Dump Enable ON (16-2), power is not supplied to the Xmtr (normally Xmtr A) for transmitting R/T TM or Exp 2 Rcdr data.	a) None	a) R/T TM or Exp 2 Rcdr data is not received, nor is the carrier wave from Xmtr A.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still control transmission of R/T TM and Exp 2 Rcdr data.	b) None	b) (1) Ground uses the Backup R/T TM ON command (S268) to obtain R/T TM. (2) Ground switches to Xmtr B or Xmtr C for transmitting R/T TM and Exp 2 Rcdr data. (3) Ground can request that the crew manually transmit R/T TM and Exp 2 Rcdr data.	b) IIIb	- - - - - - - - - -
	M	a) (1) Pole D fails open in the latch position. (2) Latch coil fails open.	a) When the ground commands Data Dump Enable ON (6-1) and Exp 1 and Exp Voice Dump Enable ON, power is not supplied to Xmtr A for transmitting Data Rcdr data.	a) None	a) The ground does not receive data from the Data Rcdr or a carrier wave from Xmtr. A.	a) N/A	- - - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground or crew can still control transmission of Data, Exp 1 and Exp Voice.	b) None	b) Ground switches to Xmtr B or Xmtr C for transmission of data from the Data Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Exp 1, Exp Voice and Data Dump Relay #2" (K3-255) (52-79703-53) (Continued)	L M S	a) Pole C fails open in the reset or latch position.	a) None - Pole C is a spare.	a) None	a) None	a) N/A	- - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relays K3-255.	a) None	a) None	a) N/A	- - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Reset coil fails open.	a) When the ground commands Data Dump Enable OFF (6-1) and Exp 1 and Exp Voice Dump Enable OFF (10-2), power is not removed from one of the TM Xmtrs (normally Xmtr A).	a) None	a) Ground continues to receive a carrier wave from the affected TM Xmtr.	a) N/A	- - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) During manned phases, power can be removed from the Xmtrs. During storage, power will be continuously applied to one of the TM Xmtrs.	b) None	b) (1) Ground requests that the crew manually control the TM Xmtrs so that power can be removed from the affected Xmtrs. (2) During storage, the ground performs necessary switching to apply the power to the 2-watt Xmtr and thus reduce the probability of failure of the 10-watt Xmtr because of the continuous application of power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "DUS Exp 1, Exp Voice and Data Dump Relay #1" (K3-107) (52-79715-13) 3.2.67	M	a) (1) Pole B fails open when the coil is energized, or, (2) The coil fails open when Relays K3-255 and K3-298 are in the reset position.	a) When the ground gives the Data Dump Enable ON (6-1) and Exp 1 and Exp Voice Dump Enable ON (10-2) commands, power is not supplied to TM Xmtr (normally Xmtr A) for transmitting the Data Rcdr data.	a) None	a) Ground does not receive the carrier wave from the Data Rcdr Xmtr (normally Xmtr A)	a) N/A	- - - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Data, Exp 1 and Exp Voice can still be transmitted by the crew or the ground.	b) None	b) (1) The ground does not attempt to transmit Data and Exp 1 and Exp Voice simultaneously, or (2) Ground requests that the crew manually control the simultaneous transmission of Data, Exp 1 and Exp Voice.	b) IIIb	
	M	a) (1) Pole A fails open when the coil is energized, or, (2) The coil fails open when Relays K3-255 and K3-298 are in the latch position.	a) (1) When the ground gives the Data Dump Enable OFF (6-1) and the Exp 1 and Exp Voice Dump Enable OFF (10-2) commands, Relays K3-255 and K3-298 do not cycle to the reset position. Power is not removed from the Data Xmtr (normally Xmtr A). The Data Rcdr data output (Channel A) is continuously connected to a TM Xmtr (normally Xmtr A). When ground commands R/T TM ON or Exp 2/Data 2 Dump Enable ON, data signal is not supplied to TM Xmtr.	a) None	a) (1) Ground continues to receive a carrier wave from the affected Xmtr (normally Xmtr A). (2) When the Data Dump Enable ON and Data Dump Execute Dump commands are given, ground receives Data from two Xmtrs. Data signal strength is reduced. (3) Ground does not receive R/T TM or Exp 2 Rcdr data.	a) N/A	- - - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Crew must manually control the transmission of data. During storage, one TM Xmtr will be continuously powered-up.	b) None	b) (1) Ground requests that the crew manually transmit desired data. (2) Ground uses Backup R/T TM on command (S268) to obtain R/T TM data (3) During storage, ground performs required switching so that the 2-watt Xmtr is the one with continuous application of power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #2, Relay #2" (K3-254) (52-79703-61) 3.2.68	L M S	a) Pole F or Pole E or Pole D fails open in the reset or latch position.	a) None - These poles are spares	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Assuming a normal mission with DCS commands S151, S452 and S454 in effect, the effect on the transmission of data is as follows: (1) When the R/T TM ON command (11-2) is given, there is a loss of the R/T TM signal to Xmtr A. (2) When the Exp 2/Data 2 Dump Enable ON command (12-2) is given, there is a loss of the Exp 2 Rcdr data output signal to Xmtr A. (3) When the Data Dump Enable ON (6-1) and Exp 1 and Exp Voice Dump Enable ON (10-2) commands are given, there is a loss of the Data Rcdr data output signal to Xmtr A.	a) None	a) (1) R/T TM data is not received. Only the Xmtr carrier wave is received. (2) Exp 2 Rcdr data is not received. Only the Xmtr carrier wave is received. (3) Data from the Data Rcdr is not received. Only the Xmtr carrier wave is received. (4) If the ground gives the R/T TM ON (11-2) and the Exp 2/Data 2 Dump Enable ON (12-2) commands, R/T TM data is not received but Exp 2 Rcdr data is received.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit the desired data.	b) None	b) (1) Ground uses the S453 DCS command to switch the Xmtr A and Xmtr B functions, or, (2) Ground requests that the crew manually transmit the desired data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #2, Relay #2" (K3-254) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) Assuming a normal mission with DCS commands S151, S452 and S454 in effect, the effect on the transmission of data is as follows: (1) When the Data and Voice Dump Enable ON command (16-2) is given, there is a loss of the Voice signal to Xmtr B. (2) When the R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2) commands are given, there is a loss of the Exp 2 Rcdr data signal to Xmtr B. (3) When the Exp 1 and Exp Voice Dump Enable ON command is given, there is a loss of the Exp Voice signal to Xmtr B.	a) None	a) (1) Ground does not receive Voice. Only the carrier wave from Xmtr B is received. (2) Ground does not receive data from the Exp 2 Rcdr. The Exp 2 Rcdr tape motion monitor indicates there is tape motion and the appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS. The Xmtr B carrier wave is received. (3) Ground does not receive Exp Voice. The Xmtr B carrier wave is received.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit the desired data.	b) None	b) (1) Ground uses the S453 DCS command to shift the data/voice signals from Xmtr B to Xmtr A, or (2) Ground requests that the crew manually transmit the desired data.	b) IIIb	
	L M S	a) Pole B or Pole C fails open in the latch position.	a) None. These poles are not used during a normal mission with DCS command S454 in effect.	a) None	a) None	a) None	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #2, Relay #2" (K3-254) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) Used only if the S453 DCS command is given. This command is not used during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. The S454 DCS command is in effect at lift-off and is expected to remain in effect during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #2, Relay #1" (K3-87) (52-79703-45) 3.2.69	L M S	a) Pole D fails open in the reset position.	a) Assuming a normal mission with DCS commands S151, S452 and S454 in effect, power is not supplied to TM Xmtr A for the following DCS commands: (1) Exp 2/Data 2 Dump Enable ON (12-2). (2) R/T TM ON (11-2). (3) Data Dump Enable ON (6-1) and Exp 1 and Exp Voice Dump Enable ON (10-2)	a) None	a) (1) Carrier wave is not received from Xmtr A. Carrier wave from the other Xmtrs is not affected. (2) If ground uses the Backup R/T TM ON command (S268), R/T TM data is received.	a) N/A	- - - - - - - - - -
This relay is used in conjunction with DCS commands S453 and S454.		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit desired data.	b) None	b) (1) Ground uses the S453 DCS command to switch the Xmtr A & B function B functions, or (2) Ground requests that the crew manually transmit the desired data.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Assuming a normal mission with DCS commands S454, S151 and S452 in effect, power is not supplied to TM Xmtr B for the following DCS commands: (1) Exp 1 and Exp Voice Dump Enable ON (10-2). (2) Data and Voice Dump Enable ON (16-2). (3) R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2). (4) Backup R/T TM ON (S268).	a) None	a) (1) Carrier wave is not received from Xmtr B. Carrier wave from other Xmtrs is not affected.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit desired data.	b) None	b) (1) Ground uses the S453 DCS command to switch the Xmtr B and Xmtr A functions, or (2) Ground requests that the crew manually transmit the desired data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT c) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #2, Relay #1" (K3-87) (52-79703-45)	L M S	a) Pole B fails open in the reset position or latch position.	a) None. During a normal mission, i.e. with DCS commands S151, S452 and S454 in effect, Pole B is not functional.	a) None	a) None	a) N/A	- - - - - - - - - -
(Continued)		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C or Pole D fails open in the latch position.	a) None. The relay is not cycled to the latch position during a normal mission	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) Used only if the S453 DCS command is given. This command is not used during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. The S454 DCS command is in effect at lift-off and is expected to remain in effect during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #1, Relay #2" (K3-253) (52-79703-61) 3.2.70	L M S	a) Pole C fails open in the reset position.	a) Assuming a normal mission with DCS commands S151, S452 and S454 in effect, the effect on the transmission of data is as follows: (1) When the Data and Voice Dump Enable ON command (16-2) is given, there is a loss of the Voice signal to Xmtr B. (2) When the R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2) commands are given, there is a loss of the Exp 2 Rcdr data signal to Xmtr B. (3) When the Exp 1 and Exp Voice Dump Enable ON command is given, there is a loss of the Exp Voice signal to Xmtr B.	a) None	a) (1) Ground does not receive Voice. Only the carrier wave from Xmtr B is received. (2) Ground does not receive data from the Exp 2 Rcdr. The Exp 2 Rcdr tape motion monitor indicates there is tape motion. The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS. The Xmtr B carrier wave is received. (3) Ground does not receive Exp Voice. The Xmtr B carrier wave is received.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit the desired data.	b) None	b) (1) Ground uses the S451 DCS command to shift the data/voice signals from Xmtr B to Xmtr C, or (2) Ground requests that the crew manually transmit the desired data.	b) IIIb	
	L M S	a) Pole B or Pole C fails open in the latch position.	a) None. These poles are not used during a normal mission with DCS command S452 in effect.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #1, Relay #2" (K3-253) (52-79703-61) (Continued)	L M S	a) Pole B fails open in the reset position.	a) Assuming a normal mission with DCS commands S151, S454 and S452 in effect, there is a loss of signal to TM Xmtr C for the following commands: (1) Exp 1 and Exp Voice Dump Enable ON (10-2). (2) Data Dump Enable ON (6-1) or Data and Voice Dump Enable ON command (16-2).	a) None	a) (1) Exp 1 Rcdr data is not received. Only the Xmtr carrier wave is received. Exp Voice is not affected. (2) Data from the Data Rcdr is not received. Only the Xmtr carrier wave is received. Voice is not affected.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit the desired data.	a) None	b) (1) Ground uses the S451 DCS command to shift the Xmtr B and Xmtr C functions, or (2) Ground requests that the crew manually transmit desired data.	b) IIIb	
	L M S	a) Pole D or Pole E or Pole F fails open in the reset of latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

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Relay, Latching, DCS Xmtr Sel. #1, Relay #2" (K3-253) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) Used only if the S451 DCS command is given. This command is not used during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. The S452 DCS command is in effect at lift-off and is expected to remain in effect during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #1, Relay #1" (K3-85) (52-79703-45) 3.2.71	L M S	a) Pole D fails open in the reset or latch position.	a) None - This pole is a spare.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Assuming a normal mission with DCS commands S454, S452 and S451 in effect, power is not supplied to TM Xmtr B for the following DCS commands: (1) Exp 1 and Exp Voice Dump Enable ON (10-2). (2) Data and Voice Dump Enable ON (16-2). (3) R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2). (4) Backup R/T TM ON (S268).	a) None	a) (1) Carrier wave is not received from Xmtr B. Carrier wave from other Xmtrs is not affected.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit desired data.	b) None	b) (1) Ground uses the S451 DCS command to switch the Xmtr B and Xmtr C functions, or (2) Ground requests that the crew manually transmit the desired data.	b) IIIb	
	L M S	a) Pole B or Pole C fails open in the latch position.	a) None. These poles are not used during a normal mission with DCS command S452 in effect.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #1, Relay #1" (K3-85) (52-79703-45) (Continued)	L M S	a) Pole B fails open in the reset position.	a) Assuming a normal mission with DCS commands S151, S454 and S452 in effect, power is not supplied to TM Xmtr C for the following DCS commands: (1) Exp 1 and Exp Voice Dump Enable ON (10-2). (2) Data and Voice Dump Enable ON (16-2). (3) Data Dump Enable ON (6-1).	a) None	a) (1) Carrier wave is not received from Xmtr C. Carrier wave from other Xmtrs is not affected.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit desired data.	b) None	b) (1) Ground uses the S451 DCS command to switch the Xmtr B and Xmtr C functions, or (2) Ground requests that the crew transmit the desired data.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) Used only if the S451 DCS command is given. This command is not used during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. The S452 DCS command is in effect at lift-off and is expected to remain in effect during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #3, Relay #1" (K2-89) (52-79703-53) 3.2.72	L M S	a) Pole E fails open in the reset position.	a) Assuming a normal mission with DCS commands S454, S452 and S151 in effect, power is not supplied to TM Xmtr B for the following DCS commands: (1) Exp 1 and Exp Voice Dump Enable ON (10-2). (2) Data and Voice Dump Enable ON (16-2). (3) R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2). (4) Backup R/T TM ON (S268)	a) None	a) (1) Carrier wave is not received from Xmtr B when commands are given. Carrier wave from other Xmtrs is not affected.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit desired data.	b) None	b) (1) Ground uses the S150 DCS command to switch the Xmtr B and Xmtr C functions, or (2) Ground requests that the crew manually transmit the desired data.	b) IIIb	
	L M S	a) Pole F or Pole D or Pole B fails open in the reset or latch position.	a) None. During a normal mission, i.e. with DCS commands S151, S452 and S454 in effect, these poles are not functional.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole E or Pole C fails open in the latch position.	a) None. During a normal mission, i.e. with DCS commands S151, S452 and S454 in effect, these poles are not functional.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "DCS Xmtr Sel. #3, Relay #1" (K3-89) (52-79703-53) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Assuming a normal mission with DCS commands S151, S454 and S452 in effect, power is not supplied to TM Xmtr C for the following DCS commands: (1) Exp 1 and Exp Voice Dump Enable ON (10-2). (2) Data and Voice Dump Enable ON (16-2). (3) Data Dump Enable ON (6-1).	a) None	a) (1) Carrier wave is not received from Xmtr C. Carrier wave from other Xmtrs is not affected.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit desired data.	b) None	b) (1) Ground uses the S150 DCS command to switch the Xmtr B and Xmtr C functions, or (2) Ground requests that the crew transmit the desired data.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) Used only if the S150 DCS command is given. This command is not used during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. The S151 DCS command is in effect at lift-off and is expected to remain in effect during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

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Relay, Latching, "DCS Xmtr Sel. #3, Relay #2" (K3-90) (52-79703-61)	L M S	a) Pole F or Pole D or Pole B fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	- - - - - - - - - -
3.2.73		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Assuming a normal mission with DCS commands S151, S452 and S454 in effect, the effect on the transmission of data is as follows: (1) When the Data and Voice Dump Dump Enable ON command (16-2) is given, there is a loss of the Voice signal to Xmtr B. (2) When the R/T TM ON (11-2) and Exp 2/Data 2 Dump Enable ON (12-2) commands are given, there is a loss of the Exp 2 Rcdr data signal to Xmtr B. (3) When the Exp 1 and Exp Voice Dump Enable ON command is given, there is a loss of the Exp Voice signal to Xmtr B.	a) None	a) (1) Ground does not receive Voice. Only the carrier wave from Xmtr B is received. (2) Ground does not receive data from the Exp 2 Rcdr. The Exp 2 Rcdr tape motion monitor indicates there is tape motion and the appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS. The Xmtr B carrier wave is received. (3) Ground does not receive Exp Voice. The Xmtr B carrier wave is received.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit the desired data.	b) None	b) (1) Ground uses the S150 DCS command to shift the data/voice signals from Xmtr B to Xmtr C, or (2) Ground requests that the crew manually transmit the desired data.	b) IIIb	

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Relay, Latching, "DCS Xmtr Sel. #3, Relay #2" (K3-90) (52-79703-51) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Assuming a normal mission with DCS commands S152, S454 and S452 in effect, there is a loss of signal to TM Xmtr C for the following commands: (1) Exp 1 and Exp Voice Dump Enable ON (10-2). (2) Data Dump Enable ON (6-1) or Data and Voice Dump Enable ON command (16-2).	a) None	a) (1) Exp 1 Rcdr data is not received. Only the Xmtr carrier wave is received. Exp Voice is not affected. (2) Data from the Data Rcdr is not received. Only the Xmtr carrier wave is received. Voice is not affected.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can still transmit the desired data.	b) None	b) (1) Ground uses the S150 DCS command to shift the Xmtr B and Xmtr C functions, or (2) Ground requests that the crew manually transmit desired data.	b) IIIb	
	L M S	a) Pole E or Pole C fails open in the latch position.	a) None. The relay is not cycled to the latch position during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

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Relay, Latching, "DCS Xmtr Sel. #3, Relay #2" (K3-90) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) Used only if the S150 DCS command is given. This command is not used during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. The S151 DCS command is in effect at lift-off and is expected to remain in effect during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Dump Execute Relay #1" (K3-299) (52-79703-61) 3.2.74	L M S	a) Pole F fails open in the latch position.	a) The playback (PB) command signal is not supplied to the Data Rcdr when the Data Rcdr Dump Execute Dump command (15-2) is given.	a) None	a) Data and/or Voice is not received from the Data Rcdr. Only the carrier wave is received from the Xmtr(s). The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) There is a loss of recorded data (subframe 1) from the Data Rcdr during unmanned phases.	b) None	b) (1) Ground requests that the crew manually control the transmission of Data and Voice from the Data Rcdr.	b) IIIb	
This relay is controlled by DCS commands on channel 15-2.	M	a) Pole C fails open in the reset position.	a) If the ground has given the Data and Voice Dump Enable ON command (16-2), but has not yet given the Dump Execute command, and the crew switches one of the Voice Record switches to the "Record" position, power is not supplied to the Voice record lights (green).	a) The Voice "RECORD" lights (green) do not come ON.	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) There is a loss of indication to the crew that they are recording Voice. If the Dump Enable ON command (16-2) has not been given, Voice Record indication is not affected.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew switches the "TAPE RECORDING DATA" switch to the "RECORD" position. The "DATA RECORD" light (on Panel 204) comes ON, indicating the Data Rcdr has tape motion. (3) Crew informs ground of observed anomaly.	b) (1) Ground coordinates with crew to determine the cause of the anomaly.	b) IIIb	

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Relay, Latching, "Data Dump Execute Relay #1" (K3-299) (52-79703-61.) (Continued)	M	a) Pole C fails open in the latch position.	a) If the crew is recording Voice and the ground gives the DCS commands for dumping the Data Rcdr, power is not removed from the Voice Record lights.	a) (1) None, unless ground has informed crew that the Data Rcdr is being dumped. Then crew observes that Voice "RECORD" lights have not extinguished.	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) There may be a loss of some recorded Voice as the crew will not know that the ground started to dump the Data Rcdr unless informed verbally by the ground.	b) Crew informs ground that Voice RECORD lights have not extinguished.	b) None	b) IIIb	
		a) Pole F fails open in the reset position.	a) None. Pole F is not functional in the reset position.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
		a) Pole D or Pole E fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
		a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

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Relay, Latching, "Data Dump Execute Relay #1" (K3-299) (52-79703-61) (Continued)	L M S	a) (1) Pole B fails open in the reset position, or (2) Latch coil fails open.	a) Relay K3-299 does not cycle to the latch position when the ground gives the Data Rcdr Dump Execute DUMP command (15-2). This results in a loss of the playback (PB) command to the Data Recorder.	a) None	a) (1) Data or Data and Voice are not received from the Data Rcdr. Only the carrier wave of the Xmtr(s) is received. (2) If R/T TM is ON, the appropriate DCS verification channel indicates the command has been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress	b) There is a loss of recorded Data (subframe 1) during unmanned phases. R/T TM and recorded Data 2 (subframe 4) are not affected.	b) None	b) (1) Ground requests that the crew manually transmit Data or Data and Voice from the Data Rcdr.	b) IIIb	
	L M S	a) (1) Pole B fails open in the latch position, or, (2) Reset coil fails open.	a) Relay K3-299 does not cycle to the reset position when the ground gives the Data Rcdr Dump Execute OFF command (15-2). The Playback (PB) command is not removed from the Data Rcdr until the Data Dump Enable OFF (6-1) Data and Voice Dump Enable OFF (16-2) command is given.	a) If the end-of-tape is reached, the Data Rcdr "STOP" light (on Panel 204) comes ON.	a) (1) The Data Rcdr continues the dump Data or Data and Voice after the Data Dump Execute OFF command is given. (2) If R/T TM is ON, the appropriate DCS verification channel indicates the command has been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress	b) None. Ground can still control the Data Rcdr in such a manner that there is no loss of data.	b) (1) Crew informs ground of the anomaly.	b) When ground desires to dump the Data Rcdr, the Tape Recording - Data Record command (S376) is used prior to the Dump Execute command to prevent the loss of some useful data at the beginning of the dump.	b) IIIb	

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Relay, Latching, "Data Dump Execute Relay #2" (K3-300) (52-79703-61) 3.2.75	L M S	a) (1) Pole B fails open when the coil is energized, or (2) The coil fails open when Relay K3-299 is in the reset position.	a) Relay K3-299 does not cycle to the latch position when the ground gives the Data Rcdr Dump Execute DUMP command (15-2). This results in a loss of the Playback (PB) command to the Data Recorder.	a) None	a) (1) Data or Data and Voice is not received from the Data Rcdr. Only the carrier wave of the Xmtr(s) is received. (2) If R/T TM is ON, the appropriate DCS verification channel indicates the command has been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) There is a loss of recorded Data (subframe 1) during unmanned phases. R/T TM and recorded Data 2 (subframe 4) are not affected.	b) None	b) (1) Ground requests that the crew manually transmit Data or Data and Voice from the Data Rcdr.	b) IIIb	
	L M S	a) (1) Pole A fails open when the coil is energized, or (2) The coil fails open when Relay K3-299 is in the latch position.	a) Relay K3-299 does not cycle to the reset position when the ground gives the Data Rcdr Dump Execute OFF command (15-2). The Playback (PB) command is not removed from the Data Rcdr until the Data Dump Enable OFF (6-1) Data and Voice Dump Enable OFF (16-2) command is given.	a) If the end-of-tape is reached, the Data Rcdr "STOP" light (On Panel 204) comes ON.	a) (1) The Data Rcdr continues the dump Data or Data and Voice after the Data Dump Execute OFF command is given. (2) If R/T TM is ON, the appropriate DCS verification channel indicates the command has been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground can still control the Data Rcdr in such a manner that there is no loss of data.	b) (1) Crew informs ground of the anomaly.	b) When ground desires to dump the Data Rcdr, the Tape Recording - Data RECORD command (S376) is used prior to the Dump Execute command to prevent the loss of some useful data at the beginning of the dump.	b) IIIb	

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Relay, Latching, "Xmtr Cntl Mode Relay #2" (K3-82) (52-79703-61) 3.2.76	L M S	a) Pole F fails open in the reset position.	a) When the ground gives the Tape Recording - Data 2 OFF command (S331) or the crew switches the Exp 1 and/or Exp 2 Record Switches to the "OFF" position, power is not removed from the Exp Rcdr Conv.	a) None	a) (1) The Exp Rcdr Bus voltage monitor channels (normally M520, M521 and M522) indicate the Exp Rcdr Bus is powered-up continuously.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None. The ground can remove power from the Exp Rcdr Conv.	b) None	b) (1) When all functions requiring Bus A or Bus B power are OFF, ground uses the PCM Bus Select commands (S274/S275) to remove power from the Conv.	b) IIIb	
This relay is controlled by the "TRANSMITTERS" switch on Panel 204. The reset position is for the "CMD" mode and the latch position is for the "OFF" and "ON" modes.	L M S	a) Pole E fails open in the reset position.	a) The Playback (PB) command signal is not supplied to the Data Rcdr when the Data Rcdr Dump Execute DUMP command (15-2) is given.	a) None	a) Data and/or Voice is not received from the Data Rcdr. Only the carrier wave is received from the Xmtr(s). The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) There is a loss of recorded Data (subframe 1) from the Data Rcdr during unmanned phases.	b) None	b) (1) Ground requests that the crew manually control the transmission of Data and Voice from the Data Rcdr.	b) IIIb	
	L M S	a) Pole B fails open in the reset latch position.	a) None - Redundancy is provided on Pole B of Relays K3-81 and K3-83.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr Cntl Mode Relay #2" (K3-82) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) The Playback (PB) command signal is not supplied to the Exp 2 Rcdr when the Exp 2/Data 2 Rcdr Dump Execute DUMP command (32-4) is given.	a) None	a) Data is not received from the Exp 2 Rcdr. Only the Xmtr carrier wave is received. The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) During unmanned phases, there is a loss of Data 2 (subframe 4) from the Exp 2 Rcdr.	b) None	b) (1) Ground requests that the crew manually control the transmission of data from the Exp 2 Rcdr.	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) The Playback (PB) command signal is not supplied to the Exp 1 Rcdr when the Exp 1 Rcdr Dump Execute DUMP command (31-4) is given.	a) None	a) Exp 1 data and Exp Voice is not received from the Exp 1 Rcdr. Only the carrier wave is received from the Xmtr(s). The appropriate DCS verification channels indicate the commands have been correctly received and decoded by the DCS.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) (1) Ground requests that the crew manually control the transmission of data and voice from the Exp 1 Rcdr.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr Cntl Mode Relay #2" (K3-82) (52-79703-61)	M	a) Reset coil fails open.	a) None. The relay is in the CMD mode at lift-off and is expected to remain in this mode (reset position) during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None NOTE - This relay is cycled to the latch position for manual control of the TM Transmitters. Since the control of data transmission will normally be via DCS commands, the latch position functions are not documented.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr Cntl Mode Relay #1" (K3-81) (52-79705-53)	M	a) Pole F fails open in the reset position.	a) When the crew switches one of the Voice Record switches to the "RECORD" position, power is not supplied to the Voice "RECORD" lights.	a) The Voice "RECORD" lights (green) do not come ON.	a) None	a) N/A	- - - - - - - - - -
3.2.77 This relay is controlled by the "TRANS-MITTERS" switch on Panel 204. The reset position is for the "CMD" mode and the latch position is for the "OFF" and "ON" modes.		b) Insulating film on contacts due to contamination.	b) There is a loss of indication to the crew that they are recording Voice.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew switches the "TAPE RECORDING DATA" switch to the "RECORD" position. The "DATA RECORD" light (on Panel 204) comes ON, indicating the Data Rcdr has tape motion. (3) Crew informs ground of observed anomaly.	b) (1) Ground coordinates with crew to determine the cause of the anomaly.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Power is not supplied to TM Xmtr A when the ground gives a DCS command which requires that Xmtr A be powered-up.	a) None	a) The carrier wave is not received from Xmtr A.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) (1) The ground cannot transmit data (or voice) via Xmtr A. (2) Crew can transmit data (or Voice) via Xmtr A.	b) None	b) (1) Ground requests that the crew manually control the TM Xmtrs, or (2) Ground switches to Xmtr B or Xmtr C to transmit data that was to have been transmitted by Xmtr A.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr Cntl Mode Relay #1" (K3-81) (52-79703-53) (Continued)	L M S	a) Pole D fails open in the reset position.	a) Power is not supplied to TM Xmtr B when the ground gives a DCS command which requires that Xmtr B be powered-up.	a) None	a) The carrier wave is not received from Xmtr B.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) (1) The ground cannot transmit data (or voice) via Xmtr B. (2) Crew can transmit data (or voice) via Xmtr B.	b) None	b) (1) Ground requests that the crew manually control the TM Xmtr(s),or (2) Ground switches to Xmtr A or Xmtr C to transmit data that was to have been transmitted by Xmtr B.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Power is not supplied to Xmtr C when the ground gives a DCS command which requires that Xmtr C be powered-up.	a) None	a) The carrier wave is not received from Xmtr C.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) (1) The ground cannot transmit data (or voice) via Xmtr C. (2) Crew can transmit data (or voice) via Xmtr C.	b) None	b) (1) Ground requests that the crew manually control the TM Xmtrs, or (2) Ground switches to Xmtr A or Xmtr B to transmit data that was to have been transmitted by Xmtr C.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B of Relays K3-82 and K3-83.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr Cntl Mode Relay #1" (K3-81) (52-79703-51)	L M S	a) Reset coil fails open.	a) None. The relay is in the CMD mode at lift-off and is expected to remain in this mode (reset position) during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None NOTE - This relay is cycled to the latch position for manual control of the TM Transmitters. Since the control of data transmission will normally be via DCS commands, the latch position functions are not documented.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr Cntl Mode Relay #3" (K3-83) (52-79703-61) 3.2.78	L S	a) Pole F fails open in the reset position.	a) When the ground commands Backup R/T TM OFF (S269) or Tape Recording - Data 2 OFF (S331), power is not removed from the PCM Bus Conv.	a) None	a) (1) The temperature of the PCM Bus Conv may be slightly higher than expected after periods of time when the Conv has supposedly been powered-down.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) (1) None. Power can be removed from the Conv.	b) None	b) When all functions requiring Bus A or Bus B power are OFF, the ground uses the PCM Bus Select commands (S274/S275) to remove power from the Conv.	b) IIIb	
This relay is controlled by the "TRANS-MITTERS" switch on Panel 204. The reset position is for the "CMD" mode and the latch position is for the "OFF" and "ON" modes.	M	a) Pole F fails open in the reset position.	a) When the ground commands Backup R/T TM OFF (S269) or Tape Recording - Data 2 OFF (S331), or the crew switches the Voice Record, or Exp 1, or Exp 2, or Data Record switches to the "OFF" position, power is not removed from the PCM Bus Conv.	a) None	a) (1) The temperature of the PCM Bus Conv may be slightly higher than expected after periods of time when the Conv has supposedly been powered-down.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) (1) None. Power can be removed from the Conv.	b) None	b) When all functions requiring Bus A or Bus B power are OFF, the ground uses the PCM Bus Select commands (S274/S275) to remove power from the Conv.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr Cntl Mode Relay #3" (K3-83) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) There is a loss of signal to TM Transmitter A.	a) None	a) Ground receives only the carrier wave from Xmtr A.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) During storage periods, Xmtr A cannot be used for transmission of data.	b) None	b) (1) Ground requests that the crew manually control the transmission of data when the quantity of data is such that three operational Xmtrs is desirable.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) There is a loss of signal to TM Transmitter B.	a) None	a) Ground receives only the carrier wave from Xmtr B.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) During storage periods, Xmtr B cannot be used for transmission of data.	b) None	b) (1) Ground requests that the crew manually control the transmission of data when the quantity of data is such that three operational Xmtrs is desirable.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) There is a loss of signal to TM Transmitter C.	a) None	a) Ground receives only the carrier wave from Xmtr C.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) During storage periods, Xmtr C cannot be used for transmission of data.	b) None	b) (1) Ground requests that the crew manually control the transmission of data when the quantity of data is such that three operational Xmtrs is desirable.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr Cntl Mode Relay #3" (K3-83) (52-79703-61) (Continued)	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relays K3-81 and K3-82.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Reset coil fails open.	a) None. This relay is in the CMD mode at lift-off and is expected to remain in this mode (reset position) during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
			NOTE - This relay is cycled to the latch position for manual control of the TM Transmitters. Since the control of data transmission will normally be via DCS commands, the latch position functions are not documented.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	c) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Select Relay #1" (K3-251) (52-79703-45) 3.2.82	L M S	a) Pole D fails open in the reset of latch position.	a) None - This pole is a spare.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) The ground cannot switch the Coaxial Switch from the 10-watt TM Xmtr to the 2-watt TM Xmtr.	a) None	a) None	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None. During a normal mission, the Coaxial Switch is cycled to the 2-watt Xmtr only if there is a failure of the 10-watt Xmtr A.	b) None	b) None	b) N/A Double Failure	
	L	a) Pole C fails open in the latch position.	a) The Coaxial Switch does not cycle to the 10-watt Xmtr A position when the ground gives the S194 DCS command.	a) None	a) (1) Carrier wave is not received from Xmtr A. (2) Coax Switch position channel (K374) indicates the switch is in the 2-watt position.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) There is a degradation of data coverage due to the substitution of the 2-watt Xmtr for the 10-watt Xmtr A.	b) None	b) (1) Ground switches to the 2-watt Xmtr for Xmtr A.	b) IIIb	
	L	a) Pole B fails open in the reset position.	a) There is a loss of power to the 2-watt Xmtr A.	a) None	a) Ground observes a loss of the 2-watt Xmtr carrier wave.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data.	b) None	b) After the vehicle has passed through the corona region, the ground switches to the 10-watt Xmtr A.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Select Relay #1" (K3-251) (52-79703-45) (Continued)	L M S	a) Pole B fails open in the latch position.	a) There is a loss of power to the 10-watt TM Xmtr A.	a) None	a) Ground observes a loss of the 10-watt Xmtr A carrier wave.	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) There is a degradation of data coverage due to the substitution of the 2-watt Xmtr for the 10-watt Xmtr A.	b) None	b) Ground switches to the 2-watt Xmtr for Xmtr A.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	--------
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L	a) Latch coil fails open.	a) The ground cannot switch from the 2-watt Xmtr to the 10-watt Xmtr for Xmtr A.	a) None	a) (1) Energy of Xmtr A carrier wave does not increase when the S194 command is given. Data signal is lost.	a) N/A	--------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) There is a degradation of data coverage due to the substitution of the 2-watt Xmtr for the 10-watt Xmtr A during the remainder of the mission.	b) None	b) (1) Ground switches to Xmtr B or Xmtr C for R/T TM. Channel K374 indicates the Coaxial Switch is in the 2-watt Xmtr position. (2) Ground switches to the 2-watt Xmtr for Xmtr A.	b) IIIb	
	L M S	a) Reset coil fails open.	a) None - The reset coil is not used during a normal mission.	a) None	a) None	a) N/A	--------
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Select Relay #2" (K3-252) (52-79703-61)	L M S	a) Pole F or Pole E or Pole D fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	- - - - - - - - - -
3.2.83		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L	a) Pole C fails open in the reset position.	a) Loss of signal return from the 2-watt TM Xmtr A.	a) None	a) Ground observes a loss of data from Xmtr A.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data. Ground can shift to the 10-watt Xmtr A.	b) None	b) Ground switches to the 10-watt Xmtr A after the vehicle has passed through the corona region.	b) IIIb	
	L	a) Pole B fails open in the reset position.	a) Loss of data signal to the 2-watt TM Xmtr A.	a) None	a) Ground observes a loss of data from Xmtr A.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data. Ground can shift to the 10-watt Xmtr A.	b) None	b) Ground switches to the 10-watt Xmtr A after the vehicle has passed through the corona region.	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) None - This pole is not functional in the latch position.	a) None	a) None	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Xmtr A Select Relay #2" (K3-252) (52-79703-61) (Continued)	L	a) Latch coil fails open.	a) Data signal and return circuits to the 2-watt Xmtr A are not disconnected when the S194 DCS command is given. This command is used to switch to the 10-watt TM Xmtr A.	a) None	a) There is a loss of data from Xmtr A after the S194 DCS Command is given. Only the carrier wave is received from the 10-watt Xmtr A.	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) There is a degradation of data coverage due to the substitution of the 2-watt Xmtr for the 10-watt Xmtr A during the remainder of the mission.	b) None	b) (1) Ground uses the S195 DCS command to switch back to the 2-watt Xmtr for Xmtr A.	b) IIIb	
	L	a) Pole B fails open in the reset position.	a) There is a loss of the data signal to the 10-watt TM Xmtr A.	a) None	a) There is a loss of data from Xmtr A after the S194 DCS command is given. Only the carrier wave is received from the 10-watt Xmtr A.	a) N/A	- - - - - - - - - -
		b) Insulating film on contacts due to contamination.	b) There is a degradation of data coverage due to the substitution of the 2-watt Xmtr for the 10-watt Xmtr A during the remainder of the mission.	b) None	b) (1) Ground uses the S195 DCS command to switch back to the 2-watt Xmtr for Xmtr A.	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. This relay is not cycled from the latch to the reset position during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
2-Watt TM Transmitter A, 52-85713-367, 230.4 MHz 3.2.84	L	a) Loss of output.	a) Loss of R/T TM data during launch.	a) None	a) Loss of carrier wave from the Xmtr.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) Temporary loss of data. After the vehicle has passed through the corona region, the 10-watt TM Xmtr A can be used.	b) None	b) Ground uses the S194 DCS command to switch to the 10-watt Xmtr for Xmtr A.	b) IIIb	
10-Watt TM Transmitter A, 610850001-19 230.4 MHz 3.2.85	L M S	a) Loss of output.	a) Loss of one 10-watt Xmtr.	a) None	a) Loss of carrier wave from the 10-watt Xmtr A.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) Some degradation of data coverage due to the substitution of the 2-watt Xmtr for the 10-watt Xmtr A.	b) None	b) Ground uses the S195 DCS command to switch to the 2-watt Xmtr for Xmtr A.	b) IIIb	
10-watt TM Transmitter B, 610850001-21, 235.0 MHz 3.2.86 and 10-watt TM Transmitter C, 610850001-23, 246.3 MHz 3.2.87 (Either one of these two Xmtrs.)	L M S	a) Loss of output from Xmtr B or Xmtr C.	a) The system will have only two working transmitter slots, i.e., Xmtr A and Xmtr B or C.	a) None	a) Loss of carrier wave from the affected TM Xmtr, i.e. Xmtr B or C.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) There is a degradation of data coverage since only two transmitter frequencies will be available.	b) None	b) Ground revises data transmission schedule to allow for reduction from 3 TM Xmtr frequencies to 2 TM Xmtr frequencies.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Filter, Electrical, M15733/01-0003 (located in Panel Ass'y - Filter, 61A762221) (Any 1 of 6) 3.2.88 thru 3.2.93 These filters are used in the power input and return circuits of the three 10-watt TM Xmtrs to filter transients from the Spacecraft AM Buses. Two filters are used for each Xmtr.	L M S	a) Filter coil fails open.	a) Loss of associated Xmtr's power input or return.	a) None	a) Loss of carrier wave from the affected TM Xmtr.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) (1) If failure is in the filter associated with Xmtr B or Xmtr C, there will be a degradation of data coverage since only two transmitter frequencies will be available. (2) If failure is in the filter associated with 10-watt Xmtr A, ground can switch to 2-watt Xmtr A. Data coverage will be reduced but not as much as with a loss of Xmtr B or Xmtr C.	b) None	b) (1) If failure is in the filter of Xmtr A, the ground uses the S195 DCS command to switch to the 2-watt TM Xmtr A. (2) If failure is in the filter associated with Xmtr B or Xmtr C, ground must revise data transmission schedule to allow for loss of one TM Xmtr.	b) IIIb	
	L M S	a) Filter capacitor fails short or open.	a) Some loss of filtering of power transients to associated TM Xmtr. Xmtr will not be damaged.	a) None	a) Ground may observe glitch in data from affected Xmtr during large power transients.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) None. Sufficient filtering is still available.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Filter, Electrical, M15733/01-0003 (located in Panel Ass'y - Filter 61A762221) 3.2.94 3.2.95 3.2.96 These filters are used to filter out transients which are generated by the Coax Switch coils whenever the switch is cycled.	L	a) Coil in filter leading to Pole C, latch position, Relay K3-251 fails open or coil in filter leading to AM Bus #1 ground fails open.	a) There is a loss of power necessary to cycle the Xmtr A Coax Switch from the 2-watt Xmtr to the 10-watt Xmtr.	a) None	a) Ground does not receive carrier wave from the 10-watt TM Xmtr A.	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) There is a degradation of data coverage because of the necessary substitution of the 2-watt Xmtr A for the 10-watt Xmtr. A	b) None	b) (1) Ground switches to Xmtr B or Xmtr C for R/T TM. Channel K374 indicates the Coax Switch is in the 2-watt Xmtr A position. (2) Ground switches to the 2-watt Xmtr A for the remainder of the mission.	b) IIIb	
	L	a) Coil in filter leading to Pole C, reset position, Relay K3-251 fails open.	a) None. This circuit is associated with the S195 command which is not used during a normal mission.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
		a) Capacitor in one of the three filters fails open or short.	a) A slight decrease in filtering capability, but not enough to affect any equipment.	a) None	a) None	a) N/A	- - - - - - - - - -
		b) Mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
PCM Interface Box, Primary Circuit (52-85713-809)	L M S	a) Loss of outputs.	a) Loss of those telemetry parameters which are dependent upon the Interface Box.	a) None.	a) Ground observes a loss of those telemetry parameters which are dependent upon the Interface Box.	a) N/A	----
3.3.01A		b) Defective component due to mechanical or thermal stress.	b) Temporary loss of TM data dependent upon the Interface Box. Crew or ground can switch to the Secondary Interface Box Circuit.	b) None.	b) (1) Ground switches to the Secondary Interface Box Circuit, or (2) Ground requests that the crew manually switch to the Secondary Interface Box Circuit.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "CMD CONTROL ELEC" (located on the Left Hand C/B Panel, Panel 200) (3-85)	M	a) Opens before normal break current is exceeded.	a)(1) Loss of power to the reset coils of Relays K3-125 through -128 and to the coil of Relay K3-129. (2) The Interface Box Control cannot be switched from the manual to command mode.	a) Crew observes bat handle of affected breaker in the open position.	a) None	a) N/A	- - -
(52-79721-322) 3.3.02		b) Internal defect, coil short to ground.	b)(1) No effect on mission. Interface Box control is expected to remain in the command mode for a normal mission.	b)(1) Crew attempts to reset the breaker. (2) Crew informs ground of the anomaly.	b) None	b) IIIb	
Circuit Breaker, Magnetic, "MANUAL CONTROLS ELEC" (located on the Left Hand C/B Panel, Panel 200) (3-62)	M	a) Opens before normal break current is exceeded.	a)(1) Loss of power necessary to switch the Electronics control from the command to manual mode. Crew cannot manually switch to the "PRI" or "SEC" Interface Box Circuit.	a) Crew observes bat handle of affected breaker in the open position.	a) None	a) N/A	- - -
(52-79721-322) 3.3.03		b) Internal defect, coil short to ground.	b)(1) No effect on mission. Interface Box control is expected to remain in the command mode for a normal mission. (2) Interface Box control to be performed by DCS during a normal mission.	b)(1) Crew attempts to reset the breaker. (2) Crew informs ground of the anomaly.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "INSTRUMENTATION SYSTEM ELECTRONICS" (Panel 204) (52-79705-21) 3.3.04 This is a three position switch used for Interface Box control.	M	a) Contact sets (11, 10 and 11, 12 and 5, 4 and 8, 9) are spare - No effect.	a) None	a) None	a) None	a) N/A	- - -
	M	a) Contact set (8, 7) fails open in the "CMD" position.	a)(1) Crew cannot switch from the manual ("PRI" or "SEC") mode to the "CMD" mode. (2) No effect if switch has not been positioned in other than the "CMD" position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b)(1) Mission not affected. Switch will be in the "CMD" position for a normal mission.	b) None	b) None	b) N/A Double failure	
	M	a) Contact set 5, 6 or 2, 1) fails open in the "SEC" position.	a) (1) Crew cannot switch to the Secondary Interface Box Circuit.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b)(1) Mission not affected. Manual control of the Interface Box Circuits is used only in the event of a loss of DCS capability.	b) None	b) None	b) N/A Double failure	
	M	a) Contact set (5, 6 or 2, 3) fails open in the "PRI" position.	a) Crew cannot switch to the Primary Interface Box Circuit.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) Mission not affected. Manual control of the Interface Box Circuits is used only in the event of a loss of DCS capability.	b) None	b) None	b) N/A Double failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Electronics Select Mode Control Relay #1" (K3-125) (52-79703-61) 3.3.10	M	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in that position for a normal mission.	a) None	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	- - -
This relay is used for selecting manual or command control of the Interface Box Circuits. Relay is controlled by the crew.	M	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-126, -127 and -128.	a) None	a) None	a) N/A	- - -
	M	a) Pole C or Pole D fails open in the reset position.	a) Loss of recorded Subframe 3 and Subframe 4 data.	a) None	a) Ground observes a loss of recorded Subframe 3 and Subframe 4 data.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) Temporary loss of recorded Subframe 3 and 4 data. Crew can switch to Manual Mode. This restores recorded Subframe 3 and 4 data.	b) None	b) Ground requests that crew manually select the desired Interface Box circuit.	b) IIIb	
	M	a) Pole E or Pole F fails open in the reset position.	a) Loss of recorded Subframe 2 data.	a) None	a) Ground observes a loss of recorded Subframe 2 data.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) Temporary loss of recorded Subframe 2 data. Crew can switch to Manual Mode. This restores recorded Subframe 2 data.	b) None	b) Ground requests that crew manually select the desired Interface Box Circuit.	b) IIIb	
		NOTE -	This relay is cycled to the latch position for manual selection of the desired Interface Box Circuit. Since Interface Box Circuit selection will normally be performed via DCS commands, the latch position functions are not documented.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Electronics Select Mode Control Relay #2" (K3-126) (52-79703-61) 3.3.11	L M S	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in that position for a normal mission.	a) None	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	- - -
	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-125, -127 and -128.	a) None	a) None	a) N/A	- - -
This relay is used for selecting manual or command control of the Interface Box Circuits. Relay is controlled by the crew.	L S	a) Pole C (or Pole D) fails open in the reset position.	a) Loss of -18 VDC (or +18 VDC) power to the AM L/L Muxes.	a) None	a) Ground observes a loss of data from the L/L Muxes located in the AM.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b)(1) Loss of data from the AM L/L Muxes. (2) Mission not affected. Mission critical parameters are not routed through the AM L/L Muxes.	b) None	b) None	b) IIIb	- - -
	M	a) Pole C (or Pole D) fails open in the reset position.	a) Loss of -18 VDC or +18 VDC) power to the AM L/L Muxes.	a) None	a) Ground observes a loss of data from the AM L/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of data from the AM L/L Muxes. (2) Crew can restore data by switching to the manual mode for Electronics control.	b) (1) Crew coordinates with ground. (2) Crew switches the "INSTRUMENTATION SYSTEM ELECTRONICS" switch (located on Panel 204) to the "PRI" or "SEC" position as requested by the ground.	b) Ground informs crew of the anomaly.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Electronics Select Mode Control Relay #2" (K3-126) (52-79703-61) (Continued)	L S	a) Pole E fails open in the reset position.	a) Loss of -5 VDC power to the AM/H/L Muxes.	a) None	a) Ground observes a loss of data from the AM H/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b)(1) Loss of data from the AM H/L Muxes. (2) Mission not affected. Mission critical parameters are not routed through the AM H/L Muxes.	b) None	b) None	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) Loss of -5 VDC power to the AM H/L Muxes.	a) None	a) Ground observes a loss of data from the AM H/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of data from AM H/L Muxes. (2) Crew can restore data by switching to the manual mode for Electronics control.	b) (1) Crew coordinates with ground. (2) Crew switches the "INSTRUMENTATION SYSTEM ELECTRONICS" switch (located on Panel 204) to the "PRI" or "SEC" position as requested by the ground.	b) Ground informs crew of the anomaly.	b) IIIb	
	L S	a) Pole F fails open in the reset position.	a) Loss of +5 VDC power to the AM L/L & H/L Muxes.	a) None	a) Ground observes a loss of data from the AM L/L & H/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b)(1) Loss of data from the AM H/L & L/L Muxes. (2) Mission not affected. Mission critical parameters are not routed through the AM H/L and L/L Muxes.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Electronics Select Mode Control Relay #2" (K3-126) (52-79703-61) (Continued)	M	a) Pole F fails open in rhe reset position. b) Insulating film on contacts due to contamination	a) Loss of +5 VDC power to the AM L/L & H/L Muxes. b)(1) Temporary loss of data from the AM L/L & H/L Muxes. (2) Crew can restore data by switching to the manual mode for Electronics control. NOTE - This relay is cycled to the latch position for manual selection of the desired Interface Box Circuit. Since Interface Box Circuit selection will normally be performed via DCS commands, the latch position functions are not documented.	a) None b)(1) Crew coordinates with ground. (2) Crew switches the "INSTRUMENTATION SYSTEM ELECTRONICS" switch (located on Panel 204) to the "PRI" or "SEC" position as requested by the ground.	a) Ground observes a loss of data from the AM L/L & H/L Muxes. b) Ground informs crew of the anomaly.	a) N/A b) IIIb	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Electronics Select Mode Control Relay #3" (K3-127) (52-79703-61) 3.3.12	L M S	a) Reset Coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in that position for a normal mission.	a) None	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) III b	
This relay is used for selecting manual or command control of the Interface Box Circuit. Relay is controlled by the crew.	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	- - -
		a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-125, -126 and -128.	a) None	a) None	a) N/A	- - -
	L S	a) Pole C (or Pole D) fails open in the reset position	a) Loss of -18 VDC (or +18 VDC) power to the OWS L/L Muxes.	a) None	a) Ground observes a loss of data from the OWS L/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Loss of data from the OWS L/L Muxes. (2) Mission not affected. There are no mission critical parameters routed through the OWS L/L Muxes.	b) None	b) None		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Electronics Select Mode control Relay #3" (K3-127) (52-79703-61) (Continued)	M	a) Pole C (or Pole D) fails open in the reset position.	a) Loss of -18 VDC (or +18 VDC) power to the OWS L/L Muxes.	a) None	a) Ground observes a loss of data from the OWS L/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data from the OWS L/L Muxes. (2) Crew can restore data by switching to the manual mode for Electronics control.	b) (1) Crew coordinates with ground. (2) Crew switches the "INSTRUMENTATION SYSTEM ELECTRONICS" switch (located on Panel 204) to the "PRI" of "SEC" position as requested by the ground.	b) Ground informs crew of the anomaly.	b) III b	
	L S	a) Pole E fails open in the reset position.	a) Loss of -5 VDC power to the OWS H/L Muxes.	a) None	a) Ground observes a loss of data from the OWS H/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Loss of data from the OWS H/L Muxes. (2) Mission not affected. There are no mission critical parameters routed through the OWS H/L Muxes.	b) None	b) None	b) III b	
	M	a) Pole E fails open in the reset position.	a) Loss of -5 VDC power to the OWS H/L Muxes.	a) None	a) Ground observes a loss of data from the OWS H/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data from the OWS H/L Muxes. (2) Crew can restore data by switching to the manual mode for Electronics Control.	b) (1) Crew coordinates with ground. (2) Crew switches the "INSTRUMENTATION SYSTEM ELECTRONICS" switch (located on Panel 204) to the "PRI" or "SEC" position as requested by the ground.	b) Ground informs crew of the anomaly.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Electronics Select Mode Control Relay #3" (K3-127) (52-79703-61) (Continued)	L S	a) Pole F fails open in the reset position.	a) Loss of +5 VDC power to the OWS H/L and L/L Muxes.	a) None	a) Ground observes a loss of data from the OWS H/L and L/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Loss of data from the OWS H/L and L/L Muxes. (2) Mission not affected. Mission critical parameters are not routed through the OWS H/L and L/L Muxes.	b) None	b) None	b) III b	
	M	a) Pole F fails open in the reset position.	a) Loss of +5 VDC power to the OWS H/L and L/L Muxes.	a) None	a) Ground observes a loss of data from the OWS H/L and L/L Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data from the OWS H/L and L/L Muxes. (2) Crew can restore data by switching to the manual mode for Electronics control.	b) (1) Crew coordinates with ground. (2) Crew switches the "INSTRUMENTATION SYSTEM ELECTRONICS" switch (located on Panel 204) to the "PRI" or "SEC" position as requested by the ground.	b) Ground informs crew of the anomaly.	b) III b	

NOTE: This relay is cycled to the latch position for manual selection of the desired Interface Box Circuit. Since Interface Box Circuit selection will normally be performed via DCS commands, the latch position functions are not documented.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Electronics Select Mode Control Relay #4" (K3-128) (52-79703-61) 3.3.13 This relay is used for selecting manual or command control of the Interface Box Circuits. Relay is controlled by the crew.	L M S	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in that position for a normal position.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A used for GSE only - No effect.	a) None.	a) None.	a) None.	a) N/A	----
	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B or Relays K3-125, -126 and -127.	a) None.	a) None.	a) N/A	----
	L M S	a) Pole C fails open in the reset position.	a) None. Redundancy provided on Pole F of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole D or Pole E fails open in the reset position.	a) There is a loss of recorded DATA 2 (Subframe 4) data.	a) None.	a) There is a loss of recorded DATA 2 data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Crew can perform switching required to restore capability of recording DATA 2 data. (2) During unmanned phases, DATA 2 data recording capability cannot be restored.	b) None.	b) Ground requested that the crew manually switch to the "PRI" or "SEC" Interface Box Circuit.	b) IIIb	
	L M S	a) Pole F fails open in the reset position.	a) None. Redundancy provided on Pole C of this relay.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

NOTE: This relay is cycled to the latch position for manual selection of the desired Interface Box Circuit. Since Interface Box Circuit selection will normally be performed via DCS commands, the latch position functions are not documented.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	c) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Electronics Select Mode Control Relay #5" (K3-129) (52-70715-11) 3.3.14 This relay is used for selecting manual or command control of the Interface Box Circuits. Relay is controlled by the crew.	M	a) Coil fails open.	a) Relays K3-125, -126, -127 and -128 cannot be cycled.	a) None	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) No effect on the mission. Relay K3-125, -126, -127 and -128 will be cycled only if there is a failure which requires manual control of the Interface Box Circuit.	b) None	b) None	b) N/A - Double Failure.	
		a) Pole A fails open when the coil is energized.	a) Relays K3-125, -126, -127 and -128 cannot be cycled from the "CMD" to the "MANUAL" position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) No effect on the mission. Relays K3-125, -126, -127 and -128 will be cycled to the "MANUAL" position only in the event of a failure which precludes DCS selection of the desired Interface Box Circuit.	b) None	b) None	b) N/A Double Failure.	
		a) Pole B Fails open when the coil is energized.	a) Relays K3-125, -126, -127 and -128 cannot be cycled from the "MANUAL" to the "CMD" position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) No effect on the mission. Relays K3-125, -126, -127 and -128 will be in the "CMD" (reset) position and will remain in that position for a normal mission.	b) None	b) None	b) III b	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) IND CATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Elect. Select, DCS Control Relay #1" (K3-157) (52-79703-61) 3.3.15	M	a) Reset coil fails open.	a) Ground cannot select the Primary Interface Box Circuit via the DCS.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Relay will be in the reset position (Pri. I/B Circuit) at lift-off and will remain in that position for a nominal mission.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A used for GSE only - No effect.	a) None.	a) None.	a) None.	a) N/A	----
This relay is used for DCS selection of the Primary or Secondary Interface Box Circuits.		a) Pole C or Pole D fails open in the reset position.	a) Loss of recorded Subframe 3 data.	a) None.	a) Ground observes a loss of recorded Subframe 3 data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of recorded Subframe 3 data. (2) Ground can select Sec. I/B Circuit, or (3) Crew can manually select the desired I/B Circuit.	b) None.	b) (1) Ground switches to the Sec. I/B Circuit, or (2) Ground request that the crew switch to the desired I/B Circuit.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) Loss of +5 VDC power to the AM H/L and L/L Mixes.	a) None.	a) Ground observes a loss of data from the AM H/L and L/L Mixes.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data from the AM H/L and L/L Mixes. (2) Ground can select Sec. I/B Circuit, or (3) Crew can manually select the desired I/B Circuit.	b) None.	b) (1) Ground switches to the Sec. I/B Circuit, or (2) Ground requests that the crew switch to the desired I/B Circuit.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW c) INDICATION d) ACTION	GROUND e) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Elect. Select, DCS Control Relay #1" (K3-157) (52-79703-61) (Continued)	E	a) Pole E or Pole F fails open in the reset position.	a) Loss of recorded Subframe 2 data.	a) None.	a) Ground observes a loss of recorded Subframe 2 data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of recorded Subframe 2 data. (2) Ground can select Sec. I/B Circuit, or (3) Crew can manually select the desired I/B Circuit.	b) None.	b) (1) Ground switches to the Sec. I/B circuit, or (2) Ground requests that the crew switch to the desired I/B Circuit.	b) IIIb	
			NOTE: This relay is cycled to the latch position for DCS selection of the Secondary Interface Box Circuit. Since the Primary Interface Box Circuit will be used for a normal mission, the latch position functions of this relay are not documented.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Elect.Select, DCS Control Relay #2" (K3-158) (52-79703-61) 3.3.16	L M S	a) Reset coil fails open.	a) Ground cannot select the Primary Interface Box Circuit via the DCS.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Relay will be in the reset position (Pri. I/B Circuit) at lift-off and will remain in that position for a normal mission.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A used for GSE only - No effect.	a) None.	a) None.	a) None.	a) N/A	----
This relay is used for DCS selection of the Primary or Secondary Interface Box Circuits.	L M S	a) Pole B fails open in the reset position.	a) Loss of -5 VDC power to the OWS H/L Mixes.	a) None.	a) Ground observes a loss of data from the OWS H/L Mixes.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data from the OWS H/L Mixes. (2) Ground can select Sec. I/B Circuit, or (3) Crew can manually select the desired I/B Circuit.	b) None.	b) (1) Ground switches to the Sec. I/B Circuit, or (2) Ground requests that the crew switch to the desired I/B Circuit.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Loss of +5 VDC power to the OWS H/L and L/L Mixes.	a) None.	a) Ground observes a loss of data from the OWS H/L and L/L Mixes.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data from the OWS H/L and L/L Mixes. (2) Ground can select Sec. I/B Circuit, or (3) Crew can manually select the desired I/B Circuit.	b) None.	b) (1) Ground switches to the Sec. I/B Circuit, or (2) Ground requests that the crew switch to the desired I/B Circuit.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Elect. Select, DCS Control Relay #2" (K3-158) (52-79703-61) (Continued)	L M S	a) Pole D (or Pole E) fails open in the reset position.	a) Loss of -18 VDC (or +18 VDC) power to the AM L/L Muxes.	a) None.	a) Ground observes a loss of data from the AM L/L Muxes.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data from the AM L/L Muxes. (2) Ground can select Sec. I/B Circuit, or (3) Crew can manually select the desired I/B Circuit.	b) None.	b) (1) Ground switches to the Sec. I/B Circuit, or (2) Ground requests that the crew switch to the desired I/B Circuit.	b) IIIb	
	L M S	a) Pole F fails open in the reset position.	a) Loss of -5 VDC power to the AM H/L Muxes.	a) None.	a) Ground observes a loss of data from the AM H/L Muxes.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data from the AM H/L Muxes. (2) Ground can select Sec. I/B Circuit, or (3) Crew can manually select the desired I/B Circuit.	b) None.	b) (1) Ground switches to the Sec. I/B Circuit or, (2) Ground requests that the crew switch to the desired I/B Circuit.	b) IIIb	
			NOTE: This relay is cycled to the latch position for DCS selection of the Secondary Interface Box Circuit. Since the Primary Interface Box Circuit will be used for a normal mission, the latch position functions of this relay are not documented.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Elect.Select, DCS Control Relay #3" (K3-159) (52-79703-61) 3.3.17	L M S	a) Reset coil fails open.	a) Ground cannot select the Primary Interface Box Circuit via the DCS.	a) None.	a) None.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Relay will be in the reset position (Pri. I/B Circuit) at lift-off and will remain in that position for a normal mission.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A used for GSE only- No effect.	a) None.	a) None.	a) None.	a) N/A	----
This relay is used for DCS selection of the Primary or Secondary Interface Box Circuits.	L M S	a) Pole D fails open in the reset position.	a) Loss of -24 VDC power to the Primary Interface Box Circuit.	a) None.	a) Loss of all TM data from the Interface Box and Muxes.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of all TM data from the Interface Box and Muxes. (2) Ground can select the Sec. I/B Circuit, or (3) Crew can manually select the desired I/B Circuit.	b) None.	b) (1) Ground switches to the Sec. I/B Circuit, or (2) Ground requests that the crew switch to the desired I/B Circuit.	b) IIIb	
	L M S	a) Pole B or Pole C fails open in the reset position.	a) There is a loss of recorded Subframe 4 (DATA 2) data.	a) None.	a) Ground observes a loss of recorded Subframe 4 (DATA 2) data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of recorded Subframe 4 data. (2) Ground can select the Sec. I/B Circuit, or (3) Crew can manually select the desired I/B circuit.	b) None.	b) (1) Ground switches to the Sec. I/B Circuit, or (2) Ground requests that the crew switch to the desired I/B circuit.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Elect. Select, DCS Control Relay #3" (K3-159) (52-79703-61) (Continued)	L M S	a) Pole E (or Pole F) fails open in the reset position.	a) Loss of -18 VDC (or +18 VDC) power to the OWS L/L Muxes.	a) None.	a) Ground observes a loss of data from the OWS L/L Muxes.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data from the OWS L/L Muxes. (2) Ground selects the Sec. I/B Circuit, or (3) Crew selects the desired I/B Circuit.	b) None.	b) (1) Ground switches to the Sec. I/B Circuit, or (2) Ground requests that the crew switch to the desired I/B Circuit.	b) IIIb	

NOTE: This relay is cycled to the latch position for DCS selection of the Secondary Interface Box Circuit. Since the Primary Interface Box Circuit will be used for a normal mission, the latch position functions of this relay are not documented.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Tape Recorder #1, 52-85713-843 3.4.0% During a normal mission, Tape Rcdr #1 is used for recording Data (subframe 1) and Voice.	L M S	a) Loss of record and/or reproduce capability.	a) Loss of recorded Data (subframe 1) and recorded Voice.	a) (1) If failure mode is due to a tape motion stoppage, the "TAPE RECORDERS 1 STOP" light (on Panel 204) comes ON. When the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the "RECORD" light does not come ON. Similarily, the Voice "RECORD" lights do not come ON when crew attempts to record Voice.	a) (1) If failure mode is due to a tape motion stoppage, the Tape Motion Monitor channel (K508) indicates no tape motion. (2) If malfunction is caused by a failure of one of the Rcdrs' electronic modules, data will not be received when the Rcdr is dumped.	a) N/A	----
		b) Mechanical or thermal stress.	b) Temporary loss of recorded Data and recorded Voice. There are four (4) on-board spare Rcdrs stowed in the OWS at lift-off.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground verifies that Rcdr #1 is not functioning correctly. (2) Ground requests that crew try manual control of the Rcdrs. This does not correct the problem. (3) Ground directs crew to replace failed Rcdr with on-board spare Rcdr. (4) During unmanned phases, ground uses DCS commands to switch to Rcdr #2 or Rcdr #3 as the Data Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Tape Recorder #2, 52-85713-843 3.4.02 During a normal mission, Tape Rcdr #2 is used for recording Exp 1 data (subframe 2) or M-509/T-013 data, and Exp Voice.	M	a) Loss of record and/or reproduce capability.	a) Loss of recorded Exp 1 (subframe 2) and recorded Exp Voice.	a) (1) If failure mode is due to a tape motion stoppage the "TAPE RECORDER 2 STOP" light (on Panel 204) comes ON. When crew switches an "EXP 1" switch to the "RECORD" position, the AM and OWS EXP 1 "RECORD" lights do not come ON.	a) (1) If failure mode is due to a tape motion stoppage, the Tape Motion Monitor channel (K509) indicates no tape motion. (2) If malfunction is caused by a failure on one of the Rcdrs' electronic modules, data will not be received when the Rcdr is dumped.	a) N/A	----
		b) Mechanical or thermal stress.	b) Temporary loss of recorded Exp 1 & recorded Voice. There are four (4) on-board spare Rcdrs stowed in the OWS at lift-off.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground verifies that Rcdr #2 is not functioning correctly. (2) Ground requests that crew try manual control of the Rcdrs. This does not correct the problem. (3) Ground directs crew to replace failed Rcdr with on-board spare Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Tape Recorder #3, 52-85713-843 3.4.03 During a normal mission, Tape Rcdr #3 is used for recording Exp 2 (subframe 3)/ Data 2 (subframe 4) data.	L M S	a) Loss of record and/or reproduce capability.	a) Loss of recorded Exp 2 (subframe 3)/Data 2 (subframe 4) data.	a) (1) If failure mode is due to a tape motion stoppage, the "TAPE RECORDER 3 STOP" light (on Panel 204) comes ON. When crew switches an "EXP2" switch to the "RECORD" position, the AM and OWS Exp 2 "RECORD" lights do not come ON.	a) (1) If failure mode is due to a tape motion stoppage, the Tape Motion Monitor channel (K510) indicates no tape motion. (2) If malfunction is caused by a failure of one of the Rcdrs' electronic modules, data will not be received when the Rcdr is dumped.	a) N/A	----
		b) Mechanical or thermal stress.	b) Temporary loss of recorded Exp 2/Data 2 data. There are four (4) on-board spare Rcdrs stowed in the OWS at lift-off.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground verifies that Rcdr #3 is not functioning correctly. (2) Ground requests that crew try manual control of the Rcdrs. This does not correct the problem. (3) Ground directs crew to replace failed Rcdr with on-board spare Rcdr.	b) IIIb	

• COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Normal, "Recorder #1 Fast Forward Control Relay" (K3-259) (52-79703-1) 3.4.04 OR Relay, Normal, "Recorder #2 Fast Forward Control Relay" (K3-260) (52-79703-1) 3.4.05 OR Relay, Normal, "Recorder #3 Fast Forward Control Relay" (K3-261) (52-79703-1) 3.4.06 (Any one of Three)	L M S	a) Pole A fails open when coil is unenergized.	a) There is a loss of the associated Rcdr's, Channel "A" (data) output to the TM Xmtr. The Channel B output (voice) is not affected.	a) None	a) Ground observes a loss of data from the associated Rcdr when data is dumped from the Rcdr.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) There will only be two Rcdrs for recording data.	b) None	b) (1) Ground informs crew of the anomaly. (2) Ground revises recording schedule to make optimum use of the two remaining Rcdr slots.	b) IIIb	
	L M S	a) Pole B fails open when the coil is unenergized.	a) There is a loss of the associated Rcdr's, Channel "B" (voice) output to the TM Xmtr. The Channel A output (data) is not affected.	a) None	a) Ground observes a loss of voice from the associated Rcdr when the Rcdr is dumped.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) There will only be two Rcdrs for recording voice.	b) None	b) (1) Ground informs crew of the anomaly. (2) Ground revises the Rcdr data assignments as necessary to reduce or eliminate voice recording on the affected Rcdr.	b) IIIb	
	L M S	a) Coil fails open.	a) The outputs of the associated Rcdr are not positively disconnected from the TM Xmtrs.	a) None	a) If the Rcdr outputs to the Xmtrs is not disconnected, and the Xmtrs is powered-up, the data received is in a reversed bit stream.	a) N/A	---
		b) Defective wire or terminal due to mechanical or terminal stress.	b) None - Interfacing equipment is not damaged by the failure.	b) None	b) (1) Ground informs crew of the anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "CONTROL RECORDER CMD" (3-86) (52-79721-322) (Rated at 3.9 amps) 3.4.07 This circuit breaker is located on Panel 200.	L M S	a) Opens before normal break current is exceeded.	a) Loss of power for the following functions: (1) Tape Recorder 1, 2 and 3 Fast Forward ON commands (i.e. 2-1, 26-4 and 19-3 ON). (2) Switching the Recorder Control Mode Relays to the CMD mode. Loss of DCS control of Tape Redr data assignments. (3) Switching the Data Record Mode Control Relays from the OFF/RECORD mode to the CMD mode. (4) Control of the Recorder Power Relays when Bus A is in the PCM Bus. If relays are in latch position when failure occurs, power is applied to related Redr whenever its Bus is powered-up. If relays are in reset position, there is a loss of power to the Redr which they are associated with. (5) Switching from Audio Load Compensator B to Audio Load Compensator A. No problem for a normal mission. Relays are in Audio Load Compensator A position at lift-off and expected to remain in this position for a normal mission.	a) (1) If a Redr is OFF when the failure occurs, when the crew switches one of the "TAPE RECORDING" switches to the "RECORD" position, its "RECORD" light does not come ON. (2) The bat handle of the "CONTROL RECORDER CMD" circuit breaker is in the tripped position.	a) (1) There is a loss of data from those Redrs powered-down when the failure occurs. The Tape Motion Monitor channels for the respective Redrs indicate no tape motion. (2) If failure occurs when a Redr is powered-up, ground observes that the Redr has tape motion whenever its Bus is powered-up, even though the powered-up condition is not for Redr operation.	a) N/A	----
		b) Internal defect, coil shorts to ground.	b) (1) If the "TAPE RECORDERS CONTROL" switch is in the "MANUAL SELECT" position when the failure occurred, there is a loss of capability to reconfigure the Tape Redr data assignments.	b) (1) Crew switches the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The "RECORD" lights test good.	b) (1) Ground switches to Bus B as the PCM Bus (DCS command, S274). This restores power for control of the Recorder Power Relays.	b) IIIb	
(Continued)			(Continued)	(Continued)	(Continued)		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "CONTROL RECORDER CMD" (3-86) (52-79721-322) (Continued)		b) Continued	b) (2) The loss of Tape Rcdr Fast Forward capability may result in a loss of some recorded data if the ground has signal acquisition trouble. (3) If the Data Rcdr is powered-down at the time of failure, ground capability to record Prime Data (subframe 1) is limited to using the Data Dump Enable ON (6-1) or the Data & Voice Dump Enable ON (16-2) commands which power the Data Rcdr in the record direction, however, these channels are automatically reset by the TX function. (4) If Data Rcdr is powered-up when failure occurs, ground can record Prime Data by using Bus A as the PCM Bus and using the Tape Recording-Data 2 RECORD command (S330), to obtain PCM Bus power for the Data Rcdr. (5) Loss of recorded Data 2 (subframe 4) during unmanned phases if failure occurred with the "TAPE RECORDING DATA" switch in the "RECORD" or "OFF" position.	b) (2) Crew attempts to reset the "CONTROL RECORDER CMD" circuit breaker. (3) Crew informs ground of the observed anomaly.	b) (2) If the "TAPE RECORDERS CONTROL" switch was in the "MANUAL SELECT" position when the failure occurred, ground requests that the crew control the Tape Rcdr data assignments. (3) If the "TAPE RECORDING DATA" switch was in the "RECORD" or "OFF" position when the failure occurred, the ground requests that the crew manually control the recording of Prime Data (subframe 1). (4) If the "TAPE RECORDING DATA" switch was in the "CMD" position when the failure occurred, ground informs crew that the switch should not be switched out of the "CMD" position. Similarily if the "TAPE RECORDERS CONTROL" switch is in the "CMD" position.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "CONTROL RECORDER MAN" (3-39 (52-79721-322) (Rated at 3.9 amps) 3.4.08 This circuit breaker is located on Panel 200.	L M S	a) Opens before normal break current is exceeded. (Continued next page)	a) Loss of power for the following functions: (1) Unregulated bus power for the Tape Motion Monitor Signal Conditioner cards (61A880063-25). This results in a loss of power for indication of tape motion on the "RECORD" lights (located on Panel 204). (2) For switching the Recorder Control Mode Relays from command to the manual mode (latch position). Crew cannot manually control the Tape Rcdr data assignments. (3) For Poles 10 & 20 of the "TAPE RECORDERS" rotary switches. This power is used for controlling the Recorder Manual Control Relays, i.e. for manual control of the Tape Rcdr data assignments. (4) For controlling the Data 2 Control Relays (latch & reset position). (5) For controlling the Data Record Man. Control Relay (latch & reset position). (6) For controlling the Recorder Power Relays when Bus B is the PCM Bus. (7) For switching from Audio Load Compensator A to Audio Load Compensator B. Compensator A is expected to be used for a normal mission.	a) (1) If the crew switches the "TAPE RECORDING DATA" switch to the "RECORD" position, the "DATA RECORD" light (on Panel 204) does not illuminate., (2) When an AM or OWS "EXP 1" or "EXP 2" switch is switched to the "RECORD" position, the respective Experiment "RECORD" lights in the AM and OWS do not illuminate. (3) The bat handle of the "CONTROL RECORDER MAN" circuit breaker is in the tripped position.	a) (1) The Tape Motion Monitor channels (k508, K509 & K510) indicate there is tape motion when their respective Rcdr is operating. (2) When the ground commands Tape Recording - Data 2 RECORD (S330), the Exp 2 Tape Motion Monitor channel (normally K510) indicates there is no tape motion. There is a loss of recorded Data 2. (3) If Data 2 is being recorded when the failure occurs, when ground commands Tape Recording - Data 2 OFF (8331), the tape motion monitor channel (normally K510) indicates tape motion does not cease. Recorder will be recording subframe 3. The Exp Rcdr Bus voltage monitor channels (normally M520, M521 & M522) indicate that the Exp Rcdr Conv is powered-up. (4) If crew switches the "TAPE RECORDING DATA" switch from the "RECORD" to the "OFF" or "CMD" position, the Data Rcdr Tape Motion Monitor channel (normally K508) indicated tape motion has stopped. This assumes failure occurred as the data was being recorded. This is a normal indication.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "CONTROL RECORDER MAN" (3-39) (52-79721-322) (Continued)		b) Internal defect, coil shorts to ground.	b) Mission continues with some loss of flexibility as noted below: (1) Crew cannot manually control the Tape Rcdr data assignments. This is normally controlled by the ground except possibly when a Rcdr is being replaced. This failure does not prevent Rcdr replacement. (2) If Data 2 (subframe 4) is not being recorded at the time of failure, there is a loss of recorded Data 2. (3) If Data 2 is being recorded at the time of failure, there is a continuous application of power to the Bus A and Bus B Converters, PCM Programmer, Interface Box, H. L. Multiplexers, L. L. Multiplexers, Group 1 and Group 2 Transducers, Instrumentation Systems Signal Conditioners, Exp 2 Tape Recorder and the AM and OWS -1 and -2 Signal Conditioners. This results in excessive power consumption. Power to the Bus B Converter can be removed by opening its circuit breaker. This removes power from the Exp 2 Rcdr. This would immobilize this Converter for storage periods. (4) Audio Load Compensator B is used only in the event of a loss of Audio Load Compensator A.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The AM "RECORD" light (on Panel 204) test good. (2) Crew attempts to reset the "CONTROL RECORDER MAN" circuit breaker. (3) Crew informs ground of observed anomaly. (4) If the "TAPE RECORDING DATA" switch is in the "CMD" or "OFF" position when the failure occurs, crew must use one of the Voice Record switches for recording Prime Data (subfrome 1) manually.	b) (1) Ground informs crew of the effect of the failure as far as control of the Instrumentation System is concerned. (2) Ground requests that the crew open the Exp Rcdr Converter circuit breaker (normally 3-9) when the Experiment Recorders are not being used.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder Control Mode Relay #1" (K3-318) (52-79715-13) 3.4.09	M	a) (1) Pole B fails open when the coil is energized, or (2) The foil fails open when the Recorder Control Mode Relays are in the reset position.	a) The Recorder Control Mode Relays (K3-319 thru K3-324) do not cycle to the latch (manual) position. The crew cannot manually control the Tape Rcdr data assignments.	a) If crew attempts to turn all or some of the Rcdrs OFF but ground has commanded operation of the Rcdr(s) for recording or dumping data, crew observes normal sounds of operation being emitted for the Rcdr(s).	a) If the crew attempts to manually configure the Rcdr data assignments to a different configuration than the ground configuration via the Recorder Select DCS Control Relays, when the ground dumps a Rcdr, they observe that the Tape Motion indication on R/T TM is from a difference Rcdr than expected. Configuration of Rcdr data assignments is the same as indicated by DCS commands last given.	a) N/A	----
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Manual control of the Rcdr data assignments is normally used only when a Rcdr is being replaced. Rcdr can still be replaced when the "TAPE RECORDERS CONTROL" switch is in the "CMD" position.	b) Crew informs ground that they have not been able to lock-out power to the Rcdr(s).	b) (1) Ground informs crew that manual control of Rcdr data assignments is not possible. (2) When crew replaces a Rcdr, ground must make certain that a DCS command is not given which will apply power to the Rcdr being replaced.	b) IIIb	
	M	a) (1) Pole A fails open when the coil is energized, or (2) The coil fails open when the Recorder Control Mode Relays are in the reset position. (Continued on next page)	a) The Recorder Control Mode Relays (K3-319 thru K3-324) do not cycle to the reset (CMD) position. There is a loss of ground capability to control the Tape Rcdr data assignments.	a) If "TAPE RECORDERS" switches have been positioned in the "OFF" position, appropriate "RECORD" indicator lights do not come ON when the crew switches a "DATA", "EXP 1", or "EXP 2" switch to the "RECORD" position.	a) (1) If the ground tries to reconfigure the Rcdr data assignments by using DCS commands, when the ground gives a record or dump command, the Tape Motion Monitor channels on R/T TM indicate the wrong Rcdr has tape motion. (2) If the ground has switched the "TAPE RECORDERS" switches to the OFF position, ground does not receive data or voice when they attempt to dump a Rcdr.		

*COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder Control Mode Relay #1" (K3-318) (52-79715-13) (Continued)		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) The Redr data assignments cannot be changed during unmanned phases.	b) (1) Crew checks switches and circuit breakers of associated equipment which could cause the failure. (2) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually control the Redr. data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #2" (K3-319) (52-79703-61) 3.4.10 This relay is controlled by the "TAPE RECORDERS CONTROL" switch on Panel 204.	M	a) Pole F fails open in the reset position.	a) There is a loss of Rcdr #1 Channel B (voice) output to the TM Xmtr.	a) None.	a) When Rcdr #1 is dumped, voice is not received by the ground. Only the TM Xmtr carrier wave is received. Data from Rcdr #1 is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Recorded voice can be restored by the crew or the ground.	b) None.	b) Ground requests that the crew manually configure the Tape Rcdr data assignments. This restores Rcdr #1 voice output to the Xmtr.	b) IIIb	
Reset position - CMD mode Latch position - Manual mode	L M S	a) Pole E fails open in the reset position.	a) There is a loss of Rcdr #1 Channel A (data) output to the TM Xmtr.	a) None.	a) When Rcdr #1 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received. Voice transmission is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) During unmanned phases, only two (2) Rcdr slots will be usable. This is sufficient for obtaining planned recorded data during unmanned phases.	b) None.	b) (1) Ground requests that the crew manually configure the Tape Rcdr assignments. This restores the data signal from the Rcdr to the Xmtr. (2) During unmanned phases, ground switches to Rcdr #2 or Rcdr #3 as the Data Rcdr.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) There is a loss of the Playback (PB) command signal to Tape Rcdr #1.	a) None.	a) When the ground attempts to dump Rcdr #1, data or data & voice are not received. Only the carrier wave from the Xmtr(s) is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) During unmanned phases, only two (2) Rcdrs will be usable. This is sufficient for obtaining planned recorded data during unmanned phases.	b) None.	b) (1) Ground requests that the crew manually configure the Tape Rcdr assignments. This restores the PB command signal to the Rcdr. (2) During unmanned phases, ground switches to Rcdr #2 or Rcdr #3 as the Data Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #2" (K3-319) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) There is a loss of the signal necessary to latch the Tape Rcdr #1 power relays for supplying power to the Rcdr. This results in power not being supplied to the Rcdr for record and dump commands.	a) (1) When the crew switches a Voice Record switch to the "RECORD" position, the Voice "RECORD" lights (green) do not come ON. (2) When the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the "DATA RECORD" light (green) does not come ON.	a) (1) When the ground gives a command requiring Rcdr #1 operation, the R/T TM Tape Motion Monitor channel (K508) indicates there is no tape motion. (2) When the ground attempts to dump Rcdr #1, only the carrier wave is received from its TM Xmtr.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) During unmanned phases, only two (2) Rcdrs will be usable. This is sufficient for obtaining planned recorded data during unmanned phases.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually configure the Tape Rcdr assignments. This restores power to the Rcdr. (2) During unmanned phases, ground switches to Rcdr #2 or Rcdr #3 as the Data Rcdr.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B of Relays K3-320, -321, -322, -323 and -324.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #2" (K3-319) (52-79703-61) (Continued)	M	a) Pole F fails open in the latch position.	a) There is a loss of Rcdr #1 Channel B (voice) output to the TM Xmtr.	a) None.	a) When Rcdr #1 is dumped, voice is not received by the ground. Only the TM Xmtr carrier wave is received. Data from Rcdr #1 is not affected..	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores Rcdr #1 voice output to Xmtr.	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) There is a loss of Rcdr # 1 Channel A (data) output to the TM Xmtr.	a) None.	a) When Rcdr #1 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received. Voice from Rcdr #1 is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores Rcdr #1 Channel A (data) output to the TM Xmtr.	b) IIIb	
	M	a) Pole D fails open in the latch position.	a) There is a loss of the Playback (PB) command signal to Tape Rcdr #1.	a) None.	a) When the ground attempts to dump Rcdr #1, data or data & voice are not received. Only the carrier wave from the Xmtr(s) is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. PB command to Rcdr #1 is restored.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #2" (K3-319) (52-79703-61) (Continued)	M	a) Pole C fails open in the latch position.	a) There is a loss of the signal necessary to latch the Tape Redr #1 power relays for supplying power to the Redr.	a) (1) When the crew switches a Voice Record switch to the "RECORD" position, the Voice "RECORD" lights (green) do not come ON. (2) When the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the "DATA RECORD" light (green) does not come ON.	a) (1) When the ground gives a command requiring Redr #1 operation, the R/T TM Tape Motion Monitor channel (K508) indicates there is no tape motion. (2) When the ground attempts to dump Redr #1, only the carrier wave is received from its TM Xmtr.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Redr data assignments.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. Power to latch coils of Redr Power Relays is restored.	b) IIIb	
	M	a) Latch coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch is placed in the "MANUAL SELECT" position, Relay K3-319 does not cycle to the latch position. The crew cannot manually select desired Redr to be the Data Redr. If the ground uses the DCS to configure the Redrs the same as the crew has manually configured them, (switch still in "MANUAL SELECT" position), Data Redr can be selected.	a) (1) None, provided the DCS commands have the Redr data assignments set the same as the manual switches. (2) If DCS command have the Redr data assignments set different then the manual switches, incorrect "RECORD" lights come ON when the crew attempts to record Data or Voice.	a) (1) None, provided the DCS has been used to configure Redrs 2 and 3 the same as the crew has manually configured them. (2) If DCS command have the Redr data assignments set different than the manual switches, incorrect data is received when ground attempts to dump the Data Redr.	a) N/A	See Note 1 on this page.

NOTE 1 - When Redr #1 is being replaced, crew and ground should coordinate to make certain that the Recorder Control Mode Relays and the Recorder Control Relays have properly cycled after the crew has manually configured the Redrs. Then the ground uses the DCS to cycle the Recorder Select DCS Control Relays for the same Redr Data assignments as the crew has manually selected. This will prevent the inadvertant application of power to an open connector.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #2" (K3-319) (52-79703-61) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Manual control of the Rcdr data assignments is expected to be used only when the crew is replacing a Rcdr.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground uses DCS commands to configure the Recorder Select DC3 Control Relays for the same Rcdr data assignments as the crew has manually selected. (2) Ground requests that the crew return control of the Rcdr data assignments to the ground.	b) IIIb	See Note 1 on previous page.
	M	a) Reset coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch is placed in the "CMD" position, Relay K3-319 does not cycle to the reset position. The ground cannot control the data assignments for Rcdr #1.	a) If "TAPE RECORDERS 1" switch is in the "OFF" position and the ground has configured the Rcdrs so that Rcdr #1 is the Data Rcdr, the Voice Record lights or Data Record light do not come ON when the crew switches a Voice Record switch or "DATA" switch to the "RECORD" position.	a) (1) Data is not received from Rcdr #1 when the ground attempts to dump the Rcdr. (2) Rcdr #1 Tape Motion Monitor channel indicates there is no tape motion.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) During unmanned phases, the ground will not be able to control the Rcdr data assignments. This will not affect acquisition of recorded data unless there is a subsequent failure which requires a change in Rcdr data assignments. R/T TM is not affected.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually control the Rcdr data assignments. (2) In preparation for unmanned phases, ground directs crew as to what the Rcdr configuration will be during storage.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #3" (K3-320) (52-79703-61) 3.4.11 This relay is controlled by the "TAPE RECORDERS CONTROL" switch on Panel 204. Reset position - CMD mode Latch position - Manual mode	M	a) Pole F fails open in the reset position.	a) There is a loss of Rcdr #2 Channel B (voice) output to the TM Xmtr.	a) None.	a) When Rcdr #2 is dumped, voice is not received by the ground. Only the TM Xmtr carrier wave is received. Data from Rcdr #2 is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The voice output to the Xmtr can be restored by the crew.	b) None.	b) (1) Ground requests that the crew manually configure the Tape Rcdr data assignments. This restores Rcdr #2 voice output to the Xmtr.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) There is a loss of Rcdr #2 Channel A (data) output to the TM Xmtr.	a) None.	a) When Rcdr #2 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received. Voice from Rcdr #2 is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The data output to the Xmtr can be restored by the crew.	b) None.	b) Ground requests that the crew manually configure the Tape Rcdr data assignments. This restores Rcdr #2 data output to the Xmtr.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) There is a loss of the signal necessary to latch the Tape Rcdr #2 power relays for supplying power to the Rcdr. This results in power not being supplied to the Rcdr for record and dump commands.	a) Assuming Rcdr #2 is the Exp 1 Rcdr, the "EXP 1 RECORD" lights do not come ON when the crew switches one of the "EXP 1" switches to the "RECORD" position.	a) (1) When the ground gives a command requiring Rcdr #1 operation, the R/T TM Tape Motion Monitor channel (K508) indicates there is no tape motion. (2) When the ground attempts to dump Rcdr #1, only the carrier wave is received from its TM Xmtr.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) During unmanned phases, only two (2) Rcdrs will be usable. This is sufficient for obtaining planned recorded data during unmanned phases.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) Ground requests that the crew manually configure the Tape Rcdr data assignments. This restores power to the Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #3" (K3-320) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) There is a loss of the Playback (PB) command signal to Tape Rcdr #2.	a) None.	a) When the ground attempts to dump Rcdr #2, data or data & voice are not received. Only the carrier wave from the Xmtr(s) is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) During unmanned phases, only two (2) Rcdrd will be usable. This is sufficient for obtaining planned recorded data during unmanned phases.	b) None.	b) Ground requests that the crew manually configure the Tape Rcdr data assignments. This restores the PB command signal to the Rcdr.	b) IIIb	
	M	a) Pole F fails open in the latch position.	a) There is a loss of Rcdr #2 Channel B (voice) output to the TM Xmtr.	a) None.	a) When Rcdr #2 is dumped, voice is not received by the ground. Only the TM Xmtr carrier wave is received. Data from Rcdr #2 is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores Rcdr #2 voice output to the Xmtr.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) There is a loss of Rcdr #2 Channel A (data) output to the TM Xmtr.	a) None.	a) When Rcdr #2 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received. Voice from Rcdr #2 is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores Rcdr. #1 Channel A (data) output to the TM Xmtr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #3" (K3-320) (52-79703-61) (Continued)	M	a) Pole D fails open in the latch position.	a) There is a loss of the signal necessary to latch the Tape Rcdr #2 power relays for supplying power to the Rcdr. This results in power not being supplied to the Rcdr for record & dump commands.	a) Depending upon the setting of the "TAPE RECORDING 2" switch, the "DATA", "VOICE", "EXP 1", or "EXP 2" light does not come ON when the crew commands the record function.	a) (1) When the ground gives a command requiring Rcdr #2 operation, the R/T TM Tape Motion Monitor channel (K509) indicates there is no tape motion. (2) When the ground attempts to dump Rcdr #2, only the carrier wave is received from its TM Xmtr.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DC3 to control the Rcdr data assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores power to the latch coil of the Tape Rcdr #2 power relays.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) There is a loss of the Playback (PB) command signal to Tape Rcdr #2.	a) None.	a) When the ground attempts to dump Rcdr #2, data or data and voice are not received. Only the carrier wave is received from the Xmtr(s).	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DC3 to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores the PB signal to Rcdr. #2.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B of Relays K3-319, -321, -322, -323 and -324.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #3" (K3-320) (52-79703-61) (Continued)	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Latch coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch is placed in the "MANUAL SELECT" position, Relay K3-320 does not cycle to the latch position. The crew cannot manually select desired Rcdr to be the Exp 1 Rcdr. If the ground uses the DCS to configure the Rcdrs the same as the crew has manually configured them (switch still in the "MANUAL SELECT" position), the Exp 1 Rcdr can be selected.	a) (1) None, provided the DCS commands have the Rcdr data assignments set the same as the manual switches. (2) If DCS commands have the Rcdr data assignments at different than the manual switches, incorrect "RECORD" lights come ON when the crew attempts the record Exp 1 data.	a) (1) None, provided the DCS has been used to configure the Rcdr data assignments the same as the crew has manually configured them. (2) If DCS commands have the Rcdr data assignments set different than the manual switches, incorrect data is received when the ground attempts to dump the Exp 1 Rcdr.	a) N/A	See Note 1 on this page.
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Manual control of the Rcdr data assignments is expected to be used only when the crew is replacing a Rcdr.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground uses DCS commands to configure the Recorder Select DCS Control Relays for the same Rcdr data assignments as the crew has manually selected. (2) Ground requests that the crew return control of t the Rcdr data assignments to the ground.	b) IIIb	

NOTE 1 - When Rcdr #2 is being replaced, crew and ground should coordinate to make certain that the Recorder Control Mode Relays and the Recorder Control Relays have properly cycled after the crew has manually configured the Rcdrs. Then the ground uses the DCS to cycle the Recorder Select DCS Control Relays for the same Rcdr data assignments as the crew has manually selected. This will prevent the inadevertent application of power to a open connector.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #3" (K3-320) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch is switched to the "CMD" position, Relay K3-320 does not cycle to the reset position. The ground cannot control the data assignments for Rcdr #2.	a) If the "TAPE RECORDERS 2" switch is in the "OFF" position and the ground has configured the Rcdrs so that Rcdr #2 is the Exp 1 Rcdr, the "EXP 1 RECORD" light does not come ON when the crew switches an "EXP 1" switch to the "RECORD" position.	a) (1) Data is not received from Rcdr #2 when the ground attempts to dump the Rcdr. (2) Rcdr #2 Tape Motion Monitor channel indicates there is no tape motion.	a0 N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) During unmanned phases, the ground will not be able to control the Rcdr data assignments. This will not affect acquisition of recorded data unless there is a subsequent failure which requires a change in Rcdr data assignments. R/T TM is not affected.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually control the Rcdr data assignments. (2) In preparation for unmanned phases, ground directs crew as to what the Rcdr configuration will be during storage.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #4" (K3-321) (52-79703-61) 3.4.12 This relay is controlled by the "TAPE RECORDERS CONTROL" switch on Panel 204. Reset position - CMD mode Latch position - Manual mode	L M S	a) Pole F fails open in the reset position.	a) There is a loss of Channel A (data) input signal from the Pgmr to Rcdr #3.	a) None.	a) (1) When Rcdr #3 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received. TM indicates there is tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The data input to Rcdr #3 can be restored by the crew. During unmanned phases, two Rcdrs are sufficient for obtaining planned recorded data.	b) None.	b) (1) Ground requests that the crew manually configure the Tape Rcdr data assignments. This restores the Channel A input to Rcdr #3. (2) During unmanned phases, ground reconfigures the Rcdrs to utilize Rcdrs 1 and 2 for recording data.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) There is a loss of Rcdr #3 Channel A (data) output from the Rcdr to the TM Xmtr.	a) None.	a) When Rcdr #3 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The data output of the Rcdr can be restored by the crew. During storage, two Rcdrs are sufficient for obtaining planned recorded data.	b) None.	b) (1) Ground requests that the crew manually configure the Tape Rcdr data assignments. This restores Rcdr #3 data output to the Xmtr. (2) During unmanned phases, ground reconfigures the Rcdrs to utilize Rcdrs 1 and 2 for recording data.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) None - Pole D is not functional in the reset position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

• COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW c) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #4" (K3-321) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) There is a loss of the Playback (PB) command signal to the Tape Rcdr #3.	a) None.	a) When the ground attempts to dump Rcdr #3, data or data & voice are not received. Only the carrier wave from the Xmtr(s) is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) During unmanned phases, only two (2) Rcdrs will be usable. This is sufficient for obtaining planned recorded data during unmanned phases.	b) None.	b) (1) Ground requests that the crew manually configure the Tape Rcdr data assignments. This restores the PB command signal to the Rcdr. (2) During unmanned phases, ground reconfigures the Rcdrs to utilize Rcdrs 1 and 2 for recording data.	b) IIIb	
	M	a) Pole F fails open in the latch position.	a) There is a loss of Channel A (data) input signal from the Pgmr to Rcdr #3.	a) None.	a) When Rcdr #3 is dumped, data is not received by the ground. Only the Xmtr carrier wave is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores Channel A input to Rcdr #3.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B of Relays K3-319, -320, -322, -323 and -324.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #4" (K3-321) (52-79703-61) (Continued)	M	a) Pole F fails open in the latch position.	a) There is a loss of Rcdr #3 Channel A (data) output from the Rcdr to the TM Xmtr.	a) None.	a) When Rcdr #3 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DSC to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores Channel A output from Rcdr #3 to the TM Xmtr.	b) IIIb	
	M	a) Pole D fails open in the latch position.	a) Loss of power to those contacts of the "TAPE RECORDERS 1/2/3" switches which are used to cycle the Rcdr Power Relays to the reset (OFF) position. The crew cannot manually remove (lock-out) power from the Rcdrs.	a) When the crew replaces a Rcdr, they should verify that the Rcdr has turned-off by touching the Rcdr and listening to the Rcdr to check for vibration and sound. If power has not been removed from the Rcdr, touch and hearing can be used to detect tape motion.	a) If ground knows that the crew has manually switched off the power to a Rcdr, the Tape Motion Monitor channel (on R/T TM) should indicate no tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) (1) If Rcdr is still operating, crew (after conferring with ground) can open circuit breaker of Conv which is supplying power to the Rcdr.	b) Ground informs crew that Rcdr appears to be powered-up.	b) IIIb	
		a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #4" (K3-321) (52-79703-61) (Continued)	M	a) Pole C fails open in the latch position.	a) There is a loss of the Playback (PB) command signal to Tape Recdr #3.	a) None.	a) When the ground attempts to dump Recdr #3, data or data & voice are not received. Only the carrier wave from the Xmtr(s) is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has been no failure which prevents operating with the "TAPE RECORDERS CONTROL" switch in the "CMD" position.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores PB signal to Recdr #3.	b) IIIb	
	M	a) Latch coil fails open.	a) (1) Crew cannot manually override ground commands and thus lock-out power to the Recdr(s) by using the "TAPE RECORDER 1, 2 or 3" switches (on Panel 204). Also, crew cannot manually configure Recdr #3 unless ground gives DCS commands to cycle Recorder Select DCS Control Relays for the same Recdr data assignments as the crew has manually commanded.	a) (1) If crew attempts to turn off a Recdr while the ground is using the Recdr for recording or dumping data, touching the Recdr or listening to the Recdr will give indication whether the Recdr is operating.	a) If crew informs ground they have turned a Recdr OFF but the ground is using the Recdr, the Tape Motion Monitor channel (on R/T TM) will indicate the Recdr still has tape motion.	a) N/A	See Note 1 on latch coil write up for Relay K3-320, page 3.4.19.
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Manual control of the Recdr data assignments is expected to be used only when the crew is replacing a Recdr.	b) (1) Crew informs ground that Recdr appears to be operating even though its "TAPE RECORDERS" switch is in the OFF position. (2) Upon direction from the ground, the crew can open the circuit breaker of the Conv which is supplying power to the Recdr.	b) (1) Ground informs crew that the Recdr appears to be powered-up. (2) Ground requests that the crew return control of the Recdr data assignments to the ground.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #4" (K3-321) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) (1) When the "TAPE RECORDERS CONTROL" switch is switchted in the "CMD" position, Relay K3-321 does not cycle to the reset position. If a "TAPE RECORDERS" switch is in the "OFF" position, the Recorder Power Relays for that Rcdr will cycle ON/OFF continuously when the ground or crew tries to use the Rcdr.	a) (1) If crew gives a command for recording data or voice on the Rcdr whose switch is in the "OFF" position, the Rcdr will not come on due to cycling of its Power Relays. Its "RECORD" indicator light will not come ON. Crew may hear odd noises out of the Rcdr if they are near it, such as the rapid clicking of its internal relay(s). (2) If the "TAPE RECORDERS" switches call for the same Rcdr data assignments as the DCS commands there is no indication of the failure.	a) (1) Data is not received from the affected Rcdr when the ground attempts to dump data from the Rcdr. The Rcdr's Tape Motion Monitor channel (on R/T TM) indicate no tape motion. (2) If the "TAPE RECORDERS" switches call for the same Rcdr data assignments as the DCS commands, there is no indication of the failure.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) During unmanned phases, the ground will not be able to control the Rcdr data assignments. This will not affect acquisition of recorded data unless there is a subsequent failure which requires a change in Rcdr data assignments. R/T TM is not affected.	b) (1) Switch the "TAPE RECORDERS CONTROL" switch to the "MANUAL SELECT" position and thus remove power from the Rcdr which is making odd noises. (2) Inform ground of the anomaly.	b) (1) Inform crew that affected Rcdr appears inoperative. (2) Request that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #5" (K3-322) (52-79703-61) 3.4.13 This relay is controlled by the "TAPE RECORDERS CONTROL" switch on Panel 204. Reset position - CMD mode Latch position - Manual mode	L M S	a) Pole F fails open in the reset position.	a) There is a loss of the Fast Forward command to Rcdr #3.	a) None.	a) After ground has removed the Fast Forward command and begins to dump Rcdr #3, ground finds that the tape has not returned to the point where they expected it to be.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, except a possible loss of some data. Fast Forward command is used if ground has had difficulty in acquiring TM Xmtr signal.	b) None.	b) Ground requests that the crew manually configure Rcdr data assignments whenever need arises for Rcdr #3 Fast Forward.	b) IIIb	
	L M S	a) Pole E or (Pole D) fails open in the reset position.	a) There is a loss of Clock signal to Rcdr #3 (or #2). This results in a loss of data recording capability on Rcdr #3 (or #2).	a) None.	a) (1) When ground dumps data from affected Rcdr, there is a loss of data. Understood. Affected Rcdr Tape Motion Monitor on R/T TM indicates there is tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The Clock signal to affected Rcdr can be restored by the crew. During unmanned phases, two Rcdrs are sufficient for obtaining planned recorded data.	b) None.	b) (1) Ground requests that the crew manuall configure the Tape Rcdr data assignments. This restores the clock signal to affected Rcdr. (2) During unmanned phases, ground reconfigures the Rcdrs to utilize the two remaining Rcdrs for recording data.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relays K3-319, -320, -321, -323, & -324.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #5" (K3-322) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) There is a loss of the Channel A (data) input to Rcdr #2.	a) None.	a) (1) When Rcdr #2 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received. Rcdr #2 Tape Motion Monitor channel (K509) indicates there is tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Channel A input to Rcdr #2 can be restored by the crew. During unmanned phases, two Rcdrs are sufficient for obtaining planned recorded data.	b) None.	b) (1) Ground requests that the crew manually configure the Rcdr data assignments. This restores Channel A input to Rcdr #2. (2) During unmanned phases, ground reconfigures the Rcdrs to utilize Rcdrs 1 and 3 for recording data.	b) IIIb	
	M	a) Pole F fails open in the latch position.	a) There is a loss of the Fast Forward command to Rcdr #3.	a) None.	a) After ground has removed the Fast Forward command and begins to dump Rcdr #3, ground finds that the tape has not returned to the point where they expected it to be.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the command position. Ground uses the DCS to control Rcdr data assignments.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #5" (K3-322) (52-79703-61) (Continued)	M	a) Pole E or (Pole D) fails open in the latch position.	a) There is a loss of Clock signal to Rcdr #3 (or #2). This results in a loss of data recording capability on Rcdr #3 (or #2).	a) None.	a) When ground dumps data from affected Rcdr, there is a loss of data. Affected Rcdr Tape Motion Monitor on R/T TM indicates there is tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS" control switch to the command position. Ground uses the DCS to control Rcdr data assignments.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) There is a loss of Channel A (data) input to Rcdr #2.	a) None.	a) When Rcdr #2 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received. Rcdr # 2 Tape Motion Monitor channel (K509) indicates there is tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the command position. Ground used the DCS to control Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay; Latching, "Recorder Control Mode Relay #5" (K3-322) (52-79703-61) (Continued)	M	a) Latch coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch is switched to the "MANUAL SELECT" position, Relay K3-322 does not cycle to the latch position. The crew cannot manually configure the data assignments of Rcdrs 2 and 3 unless the ground configures the Rcdr Select DCS Control Relays for the same data assignments.	a) None.	a) (1) None, provided the DCS has been used to configure the Rcdr data assignments the same as the crew has manually configured them. (2) If DCS commands have the Rcdr data assignments set different than the manual switches, incorrect data is received when the ground attempts to dump Rcdr #2 or Rcdr #3.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Manual control of the Rcdr data assignments is expected to be used only when the crew is replacing a Rcdr.	b) None.	b) (1) Ground uses the DCS to configure the Recorder Select DCS Control Relays for the same Rcdr data assignments as the crew has manually selected, or (2) Ground requests that the crew return control of the Rcdr data assignments to the ground.	b) IIIb	
	M	a) Reset coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch is switched to the "CMD" position, Relay K3-322 does not cycle to the reset position. The ground cannot control the data assignments for Rcdrs 2 and 3.	a) None.	a) (1) Data is not received when the ground dumps Rcdr 2 and 3. Voice from these Rcdrs is not affected.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) During manned phases, crew can control the Rcdr data assignments. (2) During unmanned phases, ground may have no control over Rcdr data assignments. However, if there are no failures, subframes 1 and 4 can still be recorded.	b) None.	b) (1) Ground requests that the crew manually control the Rcdr data assignments. (2) During unmanned phases, only Rcdr #1 can be used if ground has DCS control of the Rcdr data assignments. However, ground may have crew leave Rcdrs in a manual configuration during storage so that subframes 1 and 4 can be recorded.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #6" (K3-323) (52-79703-61) 3.4.14 This relay is controlled by the "TAPE RECORDERS CONTROL" switch on Panel 204. Reset position - CMD mode Latch position - Manual mode	L M S	a) Pole F fails open in the reset position.	a) There is a loss of the Channel A (data) input to Rcdr #1. Input to Channel B (voice) is not affected.	a) None.	a) (1) When Rcdr #1 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received. R/T TM indicates Rcdr has tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Channel A input to Rcdr #1 can be restored by the crew. During unmanned phases, two Rcdrs are sufficient for obtaining planned recorded data.	b) None.	b) (1) Ground requests that the crew manually configure Rcdr data assignments. This restores the Channel A input to Rcdr #1. (2) During unmanned phases, ground reconfigures the Rcdrs to utilize Rcdrs 2 and 3 for recording data.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) There is a loss of the Clock signal to Rcdr #1. This results in a loss of data recording capability on Rcdr #1. Voice recording is not affected.	a) None.	a) When the ground dumps data from Rcdr #1, there is a loss of data. R/T TM indicates Rcdr #1 has tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The Clock signal to the affected Rcdr can be restored by the crew. During unmanned phases, two Rcdrs are sufficient for obtaining planned recorded data.	b) None.	b) (1) Ground requests that the crew manually configure the Tape Rcdr data assignments. This restores the Clock signal to Rcdr # 1. (2) During unmanned phases, ground reconfigures the Rcdrs to utilize the two remaining Rcdrs for recording data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #6" (K3-323) (52-79703-61) (Continued)	L M S	a) Pole D or (Pole C) fails open in the reset position.	a) There is loss of the Fast Forward command to Rcdr #2 (or #1).	a) None.	a) After ground has removed the Fast Forward command and begins to dump the affected Rcdr, ground finds that the tape has not returned to the point where they expected it to be.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, except the possible loss of some data. Fast Forward command is used if ground has had difficulty in acquiring TM Xmtr signal.	b) None.	b) Ground requests that the crew manually configure Rcdr data assignments whenever need arises for Rcdr #1 or #2 Fast Forward. This restores the Fast Forward command to Rcdrs #1 & #2.	b) IIIb	
	M	a) Pole F fails open in the latch position.	a) There is a loss of Channel A (data) input to Rcdr #1. Input to Channel B (voice) is not affected.	a) None.	a) When Rcdr #1 is dumped, data is not received by the ground. Only the TM Xmtr carrier wave is received. W/O TM indicates the Rcdr has tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. This restores Channel A input to Rcdr #1.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relays K3-319, -320, -321, -322, and -324.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #6" (K3-323) (52-79703-61) (Continued)	M	a) Pole E fails open in the latch position.	a) There is a loss of the Clock signal to Rcdr #1. This results in a loss of data recording capability on Rcdr #1. Voice recording is not affected.	a) None.	a) When the ground dumps data from Rcdr #1, there is a loss of data. R/T TM indicates Rcdr #1 has tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS" control switch to the command position. Ground used the DCS to control Rcdr data assignments. This restores the Clock signal to Rcdr #1.		
	M	a) Pole D or (Pole C) fails open in the latch position.	a) There is a loss of the Fast Forward command to Rcdr #2 (or #1).	a) None.	a) After ground has removed the Fast Forward command and begins to dump the affected Rcdr, ground finds that the tape has not returned to the point where they expected it to be.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the command position. Ground uses the DCS to control Rcdr data assignments. This restores the Fast Forward command to affected Rcdrs.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #6" (K3-323) (52-79703-61) (Continued)	M	a) Latch coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch is switched to the "MANUAL SELECT" position, Relay K3-323 does not cycle to the latch position. There is a loss of the Clock & Channel A input to Rcdr #1 and the Fast Forward command to Rcdrs #1 and #2.	a) None.	a) (1) None, provided the DCS has been used to configure the Rcdr data assignments the same as the crew has manually configured them. (2) If DCS commands have the Rcdr data assignments set different than the manual switches, incorrect data or no data is received when the ground attempts to dump Rcdr #1.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Manual control of the Rcdr data assignments is expected to be used only when the crew is replacing a Rcdr.	b) None.	b) (1) Ground uses the DCS to configure the Recorder Select DCS Control Relays for the same Rcdr data assignments as the crew has manually selected. (2) Ground requests that the crew return control of the Rcdr data assignments to the ground.	b) IIIb	
	M	a) Reset coil fails open.	a) When the "TAPE RECORDERS CONTROL" swtich is switched to the "CMD" position Relay K3-323 does not cycle to the reset position. There is a loss of the Clock and Channel A input to Rcdr #1 and a loss of the Fast Forward command to Rcdr #1 and #2.	a) None.	a) (1) When the ground dumps Rcdr #1, data is not received. Voice is not affected. (2) If ground attemps Fast Forward command of Rcdr #1 or #2, the tape does not return to the point where the ground expects.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) During manned phases, the crew can control the Rcdr data assignments. (2) During unmanned pnases, there will only be two operative Rcdrs. This is sufficient for obtaining planned recorded data.	b) None.	b) (1) Ground requests that the crew manually control the Rcdr data assignments. (2) During unmanned phases, ground configures Rcdrs #2 and #3 for recording subframes 1 and 4.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #7" (K3-324) (52-79703-61) 3.4.15	M	a) Pole F fails open in the reset position.	a) There is a loss of the Rcdr #3 Channel B (voice) output to the TM Xmtr.	a) None.	a) If voice has been recorded on Rcdr #3 voice is not received when Rcdr #3 is dumped.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Voice can be recorded on other Rcdrs or the crew can restore the Rcdr #3 voice output to the TM Xmtr.	b) None.	b) (1) Ground reconfigures the Rcdr data assignments so that voice is recorded or Rcdr #1 and/or Rcdr #2, or (2) Ground requests that the crew manually configure the Rcdr data assignments.	b) IIIb	
This relay is controlled by the "TAPE RECORDERS CONTOL" switch on Panel 204. Reset position - CMD mode Latch position - Manual mode	M	a) Pole E fails open in the reset position.	a) There is a loss of Rcdr #3 tape motion monitor circuit power for turning ON the related "TAPE RECORDING RECORD" indicator lights on Panel 204 and in the OWS.	a) Assuming that Rcdr #3 is the Exp 2 Rcdr, when the crew switches an "EXP 2" switch to the "RECORD" position, the Exp 2 "RECORD" lights in the AM & OWS do not come ON.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly. (3) If Record indication is desired on the Panel lights, crew can restore this capability by manually controlling Rcdr data assignments.	b) After crew has informed ground of the anomaly, ground informs crew that R/T TM indicates Rcdr #3 has tape motion.	b) IIIb	
	M	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided on Pole B of Relays K3-319, -320, -321, -322, and -323.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #7" (K3-324) (52-79703-61) (Continued)	M	a) Pole D fails open in the reset position.	a) There is a loss of Rcdr #1 tape motion monitor circuit power for turning ON the related "TAPE RECORDING RECORD" indicator lights on Panel 204 and in the OWS.	a) Assuming that Rcdr #1 is the Data Rcdr, when the crew switches the "DATA" switch to the "RECORD" position, the Data "RECORD" light does not come ON.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly. (3) If Record indication is desired on the panel lights, crew can restore this capability by manually controlling Rcdr data assignments.	b) After crew has informed ground of the anomaly, ground informs crew that R/T TM indicates Rcdr #1 has tape motion.	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) There is a loss of Rcdr #2 tape motion monitor circuit power for turning ON the related "TAPE RECORDING RECORD" indicator lights on Panel 204 and in the OWS.	a) Assuming that Rcdr #2 is the Exp 1 Rcdr, when the crew switches an "EXP 1" switch to the "RECORD" position the Exp 1 "RECORD" lights in the AM & OWS do not come ON.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly. (3) If Record indication is desired on the Panel lights, crew can restore this capability by manually controlling Rcdr data assignments.	b) After crew has informed ground of the anomaly, ground informs crew that R/T TM indicates Rcdr #2 has tape motion.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #7" (K3-324) (52-79703-61) (Continued)	M	a) Pole F fails open in the latch position.	a) There is a loss of the Rcdr #3 Channel B (voice) output to the TM Xmtr.	a) None.	a) If voice has been recorded on Rcdr #3, voice is not received when Rcdr #3 is dumped.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Voice can be recorded on other Rcdrs or the crew can restore the Rcdr #3 voice output to the TM Xmtr by switching back to DCS control of Rcdr data assignments.	b) None.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the command position. Ground uses the DCS to control Rcdr data assignments.	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) There is a loss of Rcdr #3 tape motion monitor circuit power for turning ON the related "TAPE RECORDING RECORD" indicator lights on Panel 204 and in the OWS.	a) Assuming that Rcdr #3 is the Exp 2 Rcdr, when the crew switches an "EXP 2" switch to the "RECORD" position, the Exp 2 "RECORD" light does not come ON.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Voice Rcdr signal from Rcdr #3 to TM Xmtr can be restored.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the observed anomaly.	b) (1) After crew has informed ground of the anomaly, ground informs crew that R/T TM indicates Rcdr #3 has tape motion. (2) Ground requests that the crew switch the "TAPE RECORDERS" control switch to the command position. Ground uses the DCS to control Rcdr data assignments.	b) IIIb	
		a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #7" (K3-324) (52-79703-61) (Continued)	M	a) Pole D fails open in the latch position.	a) There is a loss of Rcdr #1 tape motion monitor circuit power for turning ON the related "TAPE RECORDING RECORD" indicator lights on Panel 204 and in the OWS.	a) Assuming that Rcdr #1 is the Data Rcdr, when the crew switches the "DATA" switch to the "RECORD" position, the Data "RECORD" light does not come ON.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of observed anomaly.	b) (1) After crew has informed ground of the anomaly, ground informs crew that R/T TM indicates Rcdr #1 has tape motion. (2) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the command position. Ground uses the DCS to control the Rcdr data assignments.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) There is a loss of Rcdr #2 tape motion monitor circuit power for turning ON the related "TAPE RECORDING RECORD" indicator lights on Panel 204 and in the OWS.	a) Assuming that Rcdr #2 is the Exp 1 Rcdr, when the crew switches an "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" lights in the AM & OWS do not come ON.	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) After crew has informed ground of the anomaly, ground informs crew that R/T TM indicates Rcdr #2 has tape motion. (2) Ground requests that the crew switch the "TAPE RECORDERS" control switch to the command position. Ground uses the DCS to control Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #7" (K3-324) (52-79703-61) (Continued)	M	a) Latch coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch is switched to the "MANUAL SELECT" position, Relay K3-324 does not cycle to the latch position. If the ground does not have the Recorder Select DCS Control Relays configured for the same Rcdr data assignments, Rcdr #3 voice output is to an open relay contact or to the wrong TM Xmtr and the Tape Monitor Monitor signals for the "TAPE RECORDING" lights will turn on the wrong light.	a) When the crew switches the "DATA" switch, the "EXP 1" switch, or the "EXP 2" switch to the "RECORD" position, the wrong "RECORD" indicator light comes ON or no "RECORD" indicator light comes ON.	a) If the ground attempts to dump voice from Rcdr #3, only the TM Xmtr carrier wave is received. Voice is not received from Rcdr #3.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Manual control of the Rcdr data assignments is expected to be used only when the crew is replacing a Rcdr.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground uses the DCS to configure the Recorder Select DCS Control Relays for the same Rcdr data assignments as the crew has manually selected, or (2) Ground requests that the crew return control of the Rcdr data assignments to the ground.	b) IIIb	
		a) Reset coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch is switched to the "CMD" position, Relay K3-324 does not cycle to the reset position. If the "TAPE RECORDERS" switches are not configured for the same Rcdr data assignments as the DCS commands, the Tape Motion Monitor signals for the "TAPE RECORDING" lights will turn on the wrong light. If the Recorder Manual Control Relays are not configured for the same Rcdr data assignments as the ground has commanded via DCS, the Rcdr #3 voice output is to an open relay contact or to the wrong TM Xmtr.	a) When the crew switches the "DATA" switch, the "EXP 1" switch, or the "EXP 2" switch to the "RECORD" position, the wrong "RECORD" indicator light comes ON or no "RECORD" indicator light comes ON.	a) If the ground attempts to dump voice from Rcdr #3, only the TM Xmtr carrier wave is received. Voice is not received from Rcdr #3.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #7" (K3-324) (52-79703-61) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) During manned phases, crew can control the Rcdr data assignments. (2) During unmanned phases, ground can operate with DCS control of the Rcdr data assignments.	b) (1) Crew checks the switches, and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "RECORDER CONTROL MODE RELAY #8" (K3-364) (52-79715-13) 3.4.16	M	a) (1) Pole A fails open when the coil is energized, or (2) The coil fails open with Relays K3-365 and K3-366 in the reset position.	a) (1) When the "TAPE RECORDERS CONTROL" switch is switched to the "MANUAL SELECT" position, Relays K3-365 and K3-366 do not cycle to the latch position. There is loss of power for resetting the Data Rcdr, Exp 1 Rcdr and Exp 2 Rcdr Power Relays and for latching the Exp 2 Rcdr Power Relays, unless the Recorder Select DCS Control Relays are configured for the same Rcdr data assignments as the "TAPE RECORDERS" switches. (2) The crew cannot manually lock-out the power for latching the Data Rcdr Exp 1 Rcdr Power Relays as determined by the Recorder Select DCS Control Relays.	a) (1) When the crew switches the "DATA" switch to the "OFF" position, audio indication from the Rcdr is that it turns OFF only when the PCM Bus Conv turns OFF. The "RECORD" indicator light turns OFF as expected. If end-of-tape is reached, Rcdr "STOP" light comes ON. (2) When the crew switches an "EXP 2" switch to the "RECORD" position, the "RECORD" indicator light does not come ON.	a) (1) R/T TM indicates that the Data Rcdr is not powered-down. (2) When the ground attempts to record the Data 2 (subframe 4) or dump the Exp 2 Rcdr, R/T TM indicates the Exp 2 Rcdr has no tape motion.	a) N/A	----
		b) (1) Insulating film on contacts due to contamination, or (2) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The Exp 2 "RECORD" light on Panel 204 tests good. (3) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. Ground uses the DCS to control Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "RECORDER CONTROL MODE RELAY #8" (K3-364) (52-79715-13) (Continued)	M	a) (1) Pole B fails open when the coil is energized, or (2) The coil fails open with Relays K3-365 and K3-366 in the latch position.	a) (1) When the "TAPE RECORDERS CONTROL" switch is switched to the "CMD" position, Relays K3-365 and K3-366 do not cycle to the reset position. There is a loss of power for resetting the Data Rcdr, Exp 1 Rcdr and Exp 2 Rcdr Power Relays and for latching the Exp 2 Rcdr Power Relays, unless the "TAPE RECORDERS" switches are configured for the same Rcdr data assignments as controlled by the DCS.	a) (1) When the crew switches the "DATA" switch to the "OFF" position, audio indication from the Rcdr indicates it turns OFF only when the PCM Bus Conv turns OFF. The "RECORD" indicator light turns OFF as expected. If end-of-tape is reached, the Data Rcdr "STOP" light comes ON. (2) When the crew switches on "EXP 2" switch to the "RECORD" position, the "RECORD" indicator light does not come ON.	a) (1) R/T TM indicates that the Data Rcdr is not powered-down. (2) When the ground attempts to record Data 2 (subframe 4) or dump the Exp 2 Rcdr, R/T TM indicates the Exp 2 Rcdr has no tape motion.	a) N/A	----
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) During unmanned phases the ground will not be able to change the Rcdr data assignments.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The Exp 2 "RECORD" light on Panel 204 tests good. (3) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #9" (K3-365) (52-79703-51) 3.4.17 This relay is controlled by the "TAPE RECORDERS CONTROL" switch on Panel 204. Reset position - CMD mode Latch position - Manual mode	L M S	a) Pole F fails open in the reset position.	a) Depending upon the position of the Rcdr 1/2 Select DCS Control Relays and the PCM Bus Select Relays, there is a loss of power to the reset coil of the Rcdr #1 Bus A Power Relays or the Rcdr #1 Bus B Power Relays when Rcdr #1 is switched from Bus A to Bus B or vice versa. The relays for powering the Rcdr from the other bus cannot be latched. For example, if the Rcdr #1 Bus A Relays do not reset, the Rcdr #1 Bus B Relays will not latch, that is Rcdr #1 cannot be powered from Bus B.	a) (1) If Rcdr #1 is the Data Rcdr and the Rcdr #1 Power relays are in such a , configuration that the Rcdr receives power from the Exp Rcdr Bus, the Data "RECORD" indicator light does not come ON when the "DATA" switch is switched to the "RECORD" position. (2) If the affected Rcdr receives power due to the bus being powered-up for other purposes, its "STOP" light will come ON if the end-of-tape is reached.	a) (1) If Bus A and Bus B are powered-down and the ground commands a data dump from Rcdr #1, data is not received from the Rc[illegible] Only the Xmtr car[illegible] wave is received. [illegible] is the Data [illegible] the ground [illegible]/T TM, the [illegible] tape motion moni[illegible] indicates [illegible] tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Equipment is not damaged. The ground or crew can reset the affected relays.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch (on Panel 207). "DATA RECORD" light tests good. (3) Crew informs ground of the anomaly.	b) (1) When Bus A and Bus B are powered-down, ground uses the PCM Bus Select commands (S274/S275) to reset the affected relays, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

NOTE - If the Rcdrs are all powered-down prior to switching any of the Rcdrs from Bus A to Bus B or vice versa, there is no effect on the system.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #9" (K3-365) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Depending upon the position of the Rcdr 1/2 and 2/3 Select DCS Relays and the PCM Bus Select Relays, there is a loss of power to the reset coil of one of the following sets of relays when the ground switches Rcdr #2 or Rcdr #3 from Bus A to Bus B or vice versa: o Rcdr #2 Bus A Power. o Rcdr #3 Bus A Power. o Rcdr #2 Bus B Power. o Rcdr #3 Bus B Power. The Relays for powering the Rcdr from the other bus cannot be latched. For example, if the Rcdr #3 Bus A Relays do not reset, the Rcdr #3 Bus B Relays will not latch, i.e. Rcdr #3 cannot be powered from Bus B.	a) (1) If Rcdr #2 or Rcdr #3 is the Data Rcdr and the Data Rcdr Power Relays are in such a configuration that the Rcdr receives power from the Exp Rcdr Bus, the Data "RECORD" indicator light does not come ON when the "DATA" switch is switched to the "RECORD" position. (2) If affected Rcdr receives power due to the bus being powered-up for other purposes, its "STOP" light will come ON if the end-of-tape is reached.	a) (1) If Bus A and Bus B are powered-down and the ground commands a data dump from the affected Rcdr, data is not received from the Rcdr. Only the Xmtr carrier wave is received. If the affected Rcdr is the Data Rcdr and the ground receives R/T TM, the tape motion monitor channel for the affected Rcdr indicates no tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Equipment is not damaged. The ground or crew can reset the affected relays.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch (on Panel 207). The "DATA RECORD" light tests good. (3) Crew informs ground of the anomaly.	b) (1) When Bus A and Bus B are powered-down, ground uses the PCM Bus Select commands (S274/S275) to reset the affected relays, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

NOTE - If the Rcdrs are all powered-down prior to switching any of the Rcdrs from Bus A to Bus B or vice versa, there is no effect on the system.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #9" (K3-365) (52-79703-61) (Continued)	M	a) Pole D fails open in the latch position.	a) When all crew and ground controlled functions requiring the Data Rcdrs are switched OFF, the Recorder Power Relays for the Data Rcdr do not cycle to the reset (OFF) position. This supplies power to the Data Rcdr whenever the PCM Bus is powered-up, such as for R/T TM.	a) If the end-of-tape is reached, the "STOP" light (on Panel 204) for the Data Rcdr comes ON.	a) The tape motion monitor channel (on R/T TM) indicates the Rcdr is operating even though the Rcdr is supposedly powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The crew or ground reset the relays.	b) (1) Crew checks the switches which could be associated with the observed anomaly. (2) Crew informs ground of observed anomaly.	b) (1) Ground verifies that the crew is not using the Data Rcdr. (2) Ground directs crew to switch the "TAPE RECORDERS" switch for the Data Rcdr to the "OFF" position to reset the Recorder Power Relays, or ground uses the PCM Bus Select (S274/S275) method to reset the Recorder Power Relays, or ground directs crew to return the control of the Rcdr data assignments to the DCS.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) When the crew or the ground attempts to perform a function requiring the Exp 2 Rcdr, its Power Relays do not cycle to the latch (ON) position. Power is not supplied to the Exp 2 Rcdr.	a) (1) If the crew switches an "EXP 2" switch to the "RECORD" position, the Exp 2 "RECORD" lights (green) do not come ON.	a) (1) When the ground attempts to dump the Exp 2 Rcdr, R/T TM indicates there is no tape motion. R/T TM indicates the Exp Rcdr Bus is powered-up.	a) N/A	----
		b) Insulating film on contacts due to contamination. (Continued next page)	b) (1) During manned phases the crew can manually control the Rcdrs.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly.	b) (1) Ground requests that the crew manually dump the Exp 2 Rcdr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #9" (K3-365) (52-79703-61) (Continued)			b)(2) During unmanned phases, there is a loss of recorded Data 2 (subframe 4). R/T subframe 4 is not affected.	b) (2) Crew informs ground of the observed anomaly. (3) If directed by the ground crew manually controls the Tape Rcdr data assignments.			
	M	a) Pole E fails open in the latch position.	a) When the crew or ground attempts to perform a function requiring the Exp 2 Rcdrs, its Power Relays do not cycle to the latch (ON) position. Power is not supplied to the Exp 2 Rcdr.	a) (1) If the crew switches an "EXP 2" switch to the "RECORD" position, the Exp 2 "RECORD" lights (green) do not come ON.	a) (1) When the ground attempts to dump the Exp 2 Rcdr, R/T TM indicates the Exp Rcdr Bus is powered-up and that the Exp 2 Rcdr has no tape motion. Similarily if the ground commands Tape Recording - Data 2 RECORD (S330), there is no tape motion even though the Exp Rcdr Bus is powered-up.		
		b) Insulating film on contacts due to contamination.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch (on Panel 207). The Exp 2 "RECORD" light on Panel 204 tests good. (3) Crew informs ground of the anomaly.	b) Ground requests that the crew return the control of the Rcdr data assignments to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #9" (K3-365) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) When all crew and ground controlled functions requiring the Data Rcdr are switched OFF, the Recorder Power Relays for the Data Rcdr do not cycle to the reset (OFF) position. This supplies power to the Data Rcdr whenever the PCM Bus is powered-up, such as for R/T TM transmission.	a) If the end-of-tape is reached. The "STOP" light (on Panel 204) for the Data Rcdr comes ON.	a) The tape motion monitor channel (on R/T TM) indicates the Rcdr is operating even though the Rcdr is supposedly powered-down.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The ground or crew can reset the relays.	b) (1) Crew checks the switches which could be associated with the observed anomaly. (2) Crew informs ground of observed anomaly. (3) If directed by the ground the crew can reset the affected relays by using the "TAPE RECORDERS" switches (on Panel 204).	b) (1) Ground verifies that the crew is not using Data Rcdr. (2) When Bus A and Bus B are both powered-down, ground momentarily switches the Bus A and Bus B functions by using the S274/S275 DCS commands. This resets the Rcdr Power Relays.	b) IIIb	
	L M S	a) Pole F or Pole C fails open in the latch position.	a) None - These poles are not functional in the latch position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B of Relay K3-366.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #9" (K3-365) (52-79703-61) (Continued)	M	a) Latch coil fails open.	a) (1) When the "TAPE RECOREDERS CONTROL" switch (on Panel 204) is switched to the "MANUAL SELECT" position, Relay K3-365 does not cycle to the latch position. There is no effect if the ground configures the Recorder Select DCS Control Relays for the same Rcdr data assignments as the crew has selected, unless crew manually turns the Exp 2 Rcdr "OFF". Then the Exp 2 Rcdr Power Relays will rapidly reset and latch if the ground attempts to use the Exp 2 Rcdr. (2) If Recorder Select DCS Control Relays are not configured for the same Exp 2 Rcdr assignment as the "TAPE RECORDERS" switches, the wrong Rcdr is powered-up when the ground or crew attemps to use the Exp 2 Rcdr.	a) (1) Crew hears clicking noises as the Rcdr turns ON and OFF with the rapid cycling of the Exp 2 Rcdr Power Relays. (2) When crew switches an "EXP 2" switch to the "RECORD" position, either the "DATA" or "EXP 1" record indicator lights comes ON.	a) (1) Ground does not receive data from the Exp 2 Rcdr or indication of tape motion. (2) Exp Rcdr +24 VDC Bus voltage may fluctuate as the Exp 2 Rcdr turns ON and OFF. (3) Ground observes that the wrong Rcdr has tape motion when they attempt to record Data 2 or dump the Exp 2 Rcdr.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a failure which prevents using the DCS to control the Rcdr data assignments.	b) Crew informs ground of anomaly.	b) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the command position. Ground uses the DCS to control Rcdr data assignments.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #9" (K3-365) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) When the "TAPE RECORDERS CONTROL" switch (on Panel 204) is switched to the "CMD" position, Relay K3-365 does not cycle to the reset position. The ground cannot control which Rcdr is the Exp 2 Rcdr as the Exp 2 Rcdr power relays will not cycle to the latch position to supply power to the Exp 2 Rcdr unless the "TAPE RECORDERS" switches are configured for the same Rcdr data assignments as the DCS Recorder Select commands. Similarity, the Data Rcdr Power Relays will not reset when the Data Rcdr is commanded OFF unless the switches and the DCS Rcdr Select Commands are set for the same data assignments. The Data Rcdr is powered-up whenever the PCM Bus is powered-up.	a) (1) When the crew switches an "EXP 2" switch to the "RECORD" position, the Exp 2 "RECORD" lights do not come ON. (2) If the end-of-tape is reached, the Data Rcdr "STOP" light comes ON.	a) (1) When the ground attempts to record Data 2 or dump the Exp 2 Rcdr, R/T TM indicates the Exp 2 Rcdr has no tape motion. (2) The Data Rcdr has tape motion whenever the PCM Bus is powered-up.	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Tape Rcdr data assignments cannot be changed by DCS during an unmanned phase.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch (on Panel 207). The Exp 2 "RECORD" light on Panel 204 tests good. (3) Crew informs ground of the anomaly.	b) (1) Ground requests that the crew manually configure the Tape Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #10" (K3-366) (52-79703-61) 3.4.18 This relay is controlled by the "TAPE RECORDERS CONTROL" switch on Panel 204. Reset position - CMD mode Latch position - Manual mode	L M S	a) Pole F fails open in the reset or latch position.	a) None - This pole is a spare.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole D fails open in the latch position.	a) When all crew and ground controlled functions requiring the Exp 1 Rcdr are switched OFF, the Recorder Power Relays for the Exp 1 Rcdr do not cycle to the reset (OFF) position. This supplies power to the Exp 1 Rcdr whenever the Exp Rcdr Bus is powered up for the Exp 2 Rcdr.	a) If the end-of-tape is reached, the "STOP" light (on Panel 204) for the Exp 1 Rcdr comes ON.	a) The tape motion monitor channel (on R/T RM) indicates the Exp 1 Rcdr is operating even though the Rcdr is supposedly powered-down.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The affected relays can be reset.	b)(1) Crew checks the switches which could be associated with the observed anomaly. (2) Crew informs ground of the observed anomaly. (3) If directed by the ground, crew switches the "TAPE RECORDERS" switch of the affected Rcdr to the "OFF" position. This resets the Exp 1 Rcdr Power Relays.	b)(1) Ground verifies that the crew is not using the Exp 1 Rcdr. (2) Ground requests that the crew return control of the Rcdr data assignments to the DCS, or (3) When Bus A and Bus B are both powered-down, the ground momentarily switches the Bus A and Bus B functions by using the S274/S275 DCS commands. This resets the Rcdr Power Relays.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder Control Mode Relay #10" (K3-366) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) When all crew and ground controlled functions requiring the Exp 2 Rcdr are switched OFF, the Recorder Power Relays for the Exp 2 Rcdr do not cycle to the reset (OFF) position. This supplies power to the Exp 2 Rcdr whenever the Exp Rcdr Bus is powered-up for the Exp 1 Rcdr.	a) If the end-of-tape is reached, the "STOP" light (on Panel 204) for the Exp 2 Rcdr comes ON.	a) The tape motion monitor channel (on R/T TM) indicates the Rcdr is operating even though the Rcdr is supposedly powered-down.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or crew can reset the relays.	b)(1) Crew checks the switches which could be associated with the observed anomaly. (2) Crew informs ground of observed anomaly. (3) If directed by the ground, crew can reset the affected relays.	b)(1) Ground verifies that the crew is not using Exp 2 Rcdr. (2) When Bus A and Bus B are both powered-down, ground momentarily switches the Bus A and Bus B functions by using the S274/S275 DCS commands. This resets the Rcdr Power Relays.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) When all crew and ground controlled functions requiring the Exp 1 Rcdr are switched OFF, the Recorder Power Relays for the Exp 1 Rcdr do not cycle to the reset (OFF) position. This supplies power to the Exp 1 Rcdr whenever the Exp Rcdr Bus is powered-up for the Exp 2 Rcdr.	a) If the end-of-tape is reached, the "STOP" light (on Panel 204) for the Exp 1 Rcdr comes ON.	a) The tape motion monitor channel (on R/T TM) indicates the Exp 1 Rcdr is operating even though the Rcdr is supposedly powered-down.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can reset the relays.	b)(1) Crew checks the switches which could be associated with the observed anomaly. (2) Crew informs ground of the observed anomaly. (3) If directed by the ground, crew can reset the affected relays.	b)(1) Ground verifies that the crew is not using the Exp 1 Rcdr. (2) When Bus A and Bus B are both powered-down, ground momentarily switches the Bus A and Bus B functions by using the S274/S275 DCS commands. This resets the Exp 1 Rcdr Power Relays.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #10" (K3-366) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Depending upon the position of the Rcdr 2/3 Select DCS Relays and the PCM Bus Select Relays, there is a loss of power to the reset coil of one of the following sets of relays when the ground switches Rcdr 2 or Rcdr 3 from Bus A to Bus B or vice versa: o Rcdr #2 Bus A Power. o Rcdr #3 Bus A Power. o Rcdr #2 Bus B Power. o Rcdr #3 Bus B Power. The relays for powering the Rcdr from the other bus cannot be latched. For example, if the Rcdr #3 Bus A Relays do not reset, the Rcdr #3 Bus B Relays will not latch, i.e., Rcdr #3 cannot be powered from Bus B.	a)(1) If Rcdr #2 or Rcdr #3 is the Data Rcdr and the Data Rcdr Power Relays are in such a configuration that the Rcdr receives power from the Exp Rcdr Bus, the Data "RECORD" indicator light does not come ON when the "DATA" switch is switched tothe "RECORD" position. (2) If affected Rcdr receives power due to the bus being powered-up for other purposes, its "STOP" light will come ON if the end-of-tape is reached.	a) If Bus A and Bus B are powered-down and the ground commands a data dump from the Rcdr whose relays have not reset, data is not received from the Rcdr. Only the Xmtr carrier wave is received.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Equipment is not damaged. The ground or crew can reset the affected relays.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch (on Panel 207). The "DATA RECORD" light tests good. (3) Crew informs ground of the anomaly.	b)(1) Ground uses the PCM Bus Select commands (S274/S275). This resets the affected relays, or (2) Ground requests that the crew manually reset the affected relays.	b) IIIb	
			NOTE - If the Rcdrs are all powered-down prior to switching any of the Rcdrs from Bus A to Bus B or vice versa, there is no effect on the system.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #10" (K3-366) (52-79703-61) (Continued)	M	a) Pole E fails open in the latch position.	a) When all crew and ground controlled functions requiring the Exp 2 Rcdr are switched OFF, the Recorder Power Relays for the Exp 2 Rcdr do not cycle to the reset (OFF) position. This supplies power to the Exp 2 Rcdr whenever the Exp Rcdr Bus is powered-up for the Exp 1 Rcdr.	a) If the end-of-tape is reached, the "STOP" light (on Panel 204) for the Exp 2 Rcdr comes ON.	a) The tape motion monitor channel (on R/T TM) indicates the Rcdr is operating even though the Rcdr is supposedly powered-down.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or crew can reset the relays.	b)(1) Crew checks the switches which could be associated with the observed anomaly. (2) Crew informs ground of the observed anomaly. (3) If directed by the ground, the crew can manually reset the affected relays.	b)(1) Ground verifies that the crew is not using the Exp 2 Rcdr. (2) When Bus A and Bus B are both powered-down, ground momentarily switches the Bus A and Bus B functions by using the S274/S275 DCS commands. This resets the Rcdr Power Relays.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) None - This pole is not functional in the latch position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M	a) Pole B fails open in the reset or latch position.	a) None - Redundancy is provided by Pole B of Relay K3-365.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Control Mode Relay #10" (K3-366) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a)(1) When the "TAPE RECORDERS CONTROL" switch (on Panel 204) is switched to the "CMD" position, Relay K3-366 does not cycle to the reset position. If the "TAPE RECORDERS" switches are set for the same Rcdr data assignments as the ground has selected via the DCS, there is no effect. (2) If the "TAPE RECORDERS" switches are in the "OFF" position, the Exp 1 and Exp 2 Rcdr Power Relays do not reset when the crew or ground switches the Rcdr(s) OFF. If the Exp Rcdr Bus is powered-up, power will be supplied to the Rcdr even if it is not being used.	a)(1) When the crew switches an Exp 1 and/or Exp 2 switch to the OFF position, audio indication is that the affected Rcdr has not turned OFF if its bus is still powered-up. "RECORD" indicator lights turn OFF as expected. NOTE - Audio indication is that the crew can hear that the affected Rcdr is still running. (2) If the end-of-tape is reached, the "STOP" light (on Panel 204) of the affected Rcdr comes ON.	a)(1) R/T TM indicates that affected Rcdr does not turn OFF unless its bus is powered-down. (2) DCS verification channel indicates that the command was correctly received and decoded.		
		b) Defective wire or terminal due to mechanical or thermal stress.	b)(1) During manned phases, the crew manually controls the Rcdr data assignments. (2) During unmanned phases, the ground can control the Rcdr data assignments and use various DCS commands the reset the affected relays.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew notifies ground of the anomaly.	b)(1) Ground requests that the crew manually configure the Tape Recorder data assignments, or (2) Ground can reset the affected relays by using DCS Recorder Seleect commands.	b) IIIb	
	M	a) Latch coil fails open.	a)(1) When the "TAPE RECORDERS CONTROL" switch (on Panel 204) is switched to the "MANUAL SELECT" position, Relay K3-366 does not cycle to the latch position. There is no effect if the ground configures the Recorder Select DCS Control Relays for the same Rcdr data assignments as the crew has selected. (2) If the Recorder Select DCS Control Relays are not configured for the same Rcdr data assignments as the crew has manually selected, the Exp 1 Rcdr OFF and/or the Exp 2 Rcdr OFF signals go to the reset coils of the wrong Rcdr Power Relays.	a)(1) When crew switches an Exp 1 and/or Exp 2 switch to the "OFF" position, audio indication is that the affected Rcdr has not turned OFF if its bus is still powered-up. "RECORD" indicator lights turn OFF as expected.	a) R/T TM indicates that affected Rcdr does not turn OFF unless its bus is powered-down.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relays, Latching, "Recorder Control Mode Relay #10" (KJ-366) (52-79703-61) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, assuming there has not been a failure which prevents using the DCS to control the Redr data assignments.	b)(1) Crew checks the switches of associated equipment which could cause the anomaly. (2) Crew informs ground of observed anomaly.	b)(1) Ground requests that the crew switch the "TAPE RECORDERS CONTROL" switch to the "CMD" position. Ground uses the DCS to control Redr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "TAPE RECORDERS CONTROL" (on Panel 204) (52-79705-1) 3.4.19	M	a) Contact set (5,6) fails open when the switch is switched to the "MANUAL SELECT" position.	a) Power is not applied to the latch coil of the Recorder Control Mode Relays and to Poles 10 and 20 of the "TAPE RECORDERS 1/2/3" switches (on Panel 204). As a result, the crew cannot manually control the Rcdr data assignments.	a) None	a) If the crew has the "TAPE RECORDERS 1/2/3" switches set for a different Rcdr data assignment configuration than the Recorder Select DCS Control Relays, then the ground observes (via the tape motion monitor channels) that the Rcdrs which are powered-up for DCS commands are the same as those determined by the Recorder Select DCS Control Relays.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) DCS control of Rcdr data assignments must be used for the remainder of the mission.	b) None	b) Ground requests that the crew return the "TAPE RECORDERS CONTROL" switch to the "CMD" position.	b) IIIb	
	L M S	a) Contact set (5,4 or 2,3) fails open.	a) None. These contact sets are not functional.	a) None	a) None	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Contact set (2,1) fails open when the switch is switched to the "CMD" position.	a) Power is not applied to the reset coil of the Recorder Control Mode Relays. As a result, the ground cannot control the Rcdr data assignment via the DCS.	a) If the "TAPE RECORDERS 1/2/3" switches (on Panel 204) are in the "OFF" position, the "RECORD" indicator lights do not come ON when the "DATA", or "EXP 1", or "EXP 2" or one of the voice switches is switched to the "RECORD" position.	a) If the "TAPE RECORDERS 1/2/3" switches (on Panel 204) are in the "OFF" position, the ground does not get data or voice when they attempt to dump one of the Rcdrs. R/T TM indicates that none of the Rcdrs has tape motion for record or dump commands.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) For the remainder of the mission, the Rcdr data assignments cannot be controlled by DCS commands. In the event of a failure during unmanned phases, the ground will not be able to change the Rcdr data assignments, however, R/T TM will still be available.	b) 1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. 2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. 3) Crew checks for audio indication of Rcdr operation. 4) Crew informs the ground of the anomaly.	b) 1) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Exp 1 Recorder Motion Monitor Relay #1" (K3-285) (52-79703-45) 3.4.20	L M S	a) Pole D fails open in the reset or latch position.	a) None - This pole is a spare.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None - This pole is not functional in the reset position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
This relay is used for switching the Exp 1 "RECORD" indicator lights power ON/OFF.	M	a)(1) Pole C fails open in the latch position, or Pole B fails open in the reset position, or (2) Latch coil fails open.	a) There is a loss of power to the Exp 1 "RECORD" lights in the AM and the OWS.	a) When the crew switches an "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" indicator lights in the AM and OWS do not come ON.	a) None	a) N/A	---
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None - Exp 1 "RECORD" indicator light is not necessary for recording Exp 1 data.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The AM Exp 1 "RECORD" light tests good. (3) Crew notes that the Rcdr sounds like it is running. (4) Crew informs ground of the anomaly.	b)(1) Ground uses R/T TM to verify that the Exp 1 Rcdr has tape motion.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Exp 1 Recorder Motion Monitor Relay #1" (K3-285) (52-79703-45)	M	a)(1) Pole B fails open in the latch position, or (2) Reset coil fails open.	a) Relay K3-285 does not reset when the "EXP 1" switches are switched to the "OFF" position. Power is not supplied to the Exp 1 "RECORD" light because the AM Exp 1 and OWS Exp 1 Record Relays are in the reset position.	a) None	a) None	a) N/A	---
(Continued)		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Exp 1 Recorder Motion Monitor Relay #2" (K3-286) (52-79715-13) 3.4.21 This relay is used in conjunction with the "EXP 1" switches to cycle Relay K3-285.	M	a)(1) Pole B fails open when the coil is energized, or (2) Coil fails open when Relay K3-285 is in the reset position.	a) There is a loss of power to the Exp 1 "RECORD" lights in the AM and the OWS.	a) When the crew switches an "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" indicator lights in the AM and OWS do not come ON.	a) None	a) N/A	---
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None - Exp 1 "RECORD" indicator light is not necessary for recording Exp 1 data.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The AM Exp 1 "RECORD" light tests good. (3) Crew notes that the Rcdr sounds like it is running. (4) Crew informs ground of the anomaly.	b)(1) Ground uses R/T TM to verify that the Exp 1 Rcdr has tape motion.	b) IIIb	
	M	a)(1) Pole A fails open when the coil is energized, or (2) Coil fails open when Relay K3-285 is in the latch position.	a) Relay K3-285 does not reset when the "EXP 1" switches are switched to the "OFF" position. Power is not supplied to the Exp 1 "RECORD" light because the AM Exp 1 and OWS Exp 1 Record Relays are in the reset position.	a) None	a) None	a) N/A	---
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Exp 2 Recorder Motion Monitor Relay #" (K3-287) (52-79703-45) 3.4.22	L M S	a) Pole D fails open in the reset or latch position.	a) None - This pole is a spare.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) None - This pole is not functional in the reset position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a)(1) Pole C fails open in the latch position, or Pole B fails open in the reset position, or (2) Latch coil fails open.	a) There is a loss of power to the Exp 2 "RECORD" lights in the AM and the OWS.	a) When the crew switches an "EXP 2" switch to the "RECORD" position, the Exp 2 "RECORD" indicator lights in the AM and OWS do not come ON.	a) None	a) N/A	---
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None - Exp 2 "RECORD" indicator light is not necessary for recording Exp 2 data.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The AM Exp 2 "RECORD" light tests good. (3) Crew notes that the Rcdr sounds like it is running. (4) Crew informs ground of the anomaly.	b)(1) Ground uses R/T TM to verify that the Exp 2 Rcdr has tape motion.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Exp 2 Recorder Motion Monitor Relay #1" (K3-287) (52-79703-45)	M	a)(1) Pole B fails open in the latch position, or (2) Reset coil fails open.	a) Relay K3-287 does not reset when the "EXP 2" switches are switched to the "OFF" position. Power is not supplied to the Exp 2 "RECORD" light because the AM Exp 2 and OWS Exp 2 Record Relays are in the reset position.	a) None	a) None	a) N/A	---
(Continued)		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Exp 2 Recorder Motion Monitor Relay #2" (K3-288) (52-79715-13) 3.4.23 This relay is used in conjunction with the "EXP 2" switches to cycle Relay K3-287.	M	a)(1) Pole B fails open when the coil is energized, or (2) Coil fails open when Relay K3-287 is in the reset position.	a) There is a loss of power to the Exp 2 "RECORD" lights in the AM and the OWS.	a) When the crew switches an "EXP 2" switch to the "RECORD" position, the Exp 2 "RECORD" indicator lights in the AM and OWS do not come ON.	a) None	a) N/A	---
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None - Exp 2 "RECORD" indicator light is not necessary for recording Exp 2 data.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The AM Exp 2 "RECORD" light tests good. (3) Crew notes that the Rcdr sounds like it is running. (4) Crew informs ground of the anomaly.	b)(1) Ground uses R/T TM to verify that the Exp 2 Rcdr has tape motion.	b) IIIb	
	M	a)(1) Pole A fails open when the coil is energized, or (2) Coil fails open when Relay K3-287 is in the latch position.	a) Relay K3-287 does not reset when the "EXP 2" switches are switched to the "OFF" position. Power is not supplied to the Exp 2 "RECORD" light because the AM Exp 2 and OWS Exp 2 Record Relays are in the reset position.	a) None	a) None	a) I/A	---
		b)(1) Insulating film on contacts due to contamination. (2) Defective wire or termainal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #1" (K3-188) (52-79703-61) 3.4.24 This relay is used for DCS control of the data assignments of Rcdrs 2 and 3.	L M S	a) Pole F fails open in the reset position.	a) There is a loss of the Fast Forward (FF) command to Rcdr #2 when the S171 command is in effect.	a) None	a) When the ground removes the FF command from Rcdr #2 and begins dumping the Rcdr, they observe that the tape has not advanced to the point where they thought it should be. R/T TM indicates the command was correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command and then gives the FF command for Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments and then the ground gives the FF command for Rcdr #2.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) There is a loss of the "A" channel (data) input to Rcdr #3.	a) None	a) When Rcdr #3 is dumped, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command to restore the channel "A" input to Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #1" (K3-188) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) There is a loss of the "A" channel (data) input to Rcdr #2.	a) None	a) When Rcdr #2 is dumped, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command to restore the channel "A" input to Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) There is a loss of the clock input signal to Rcdr #3. This results in a loss of data recording capability on Rcdr #3. Voice recording on Rcdr #3 is not affected.	a) None	a) When Rcdr #3 is dumped, meaningless data is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The crew or the ground can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command to restore the clock signal to Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) There is a loss of the clock input signal to Rcdr #2.	a) None	a) When Rcdr #2 is dumped, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command to restore the clock signal to Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #1" (K3-188) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) When the ground switches from the S170 DCS command to the S171 command, Relay K3-188 does not reset. This results in the following: o Rcdr #2 FF command goes to Rcdr #3. o Rcdr #3 channel "A" input goes to Rcdr #2. o Rcdr #2 channel "A" input goes to Rcdr #3. o Rcdr #3 clock input signal goes to Rcdr #2. o Rcdr #2 clock input signal goes to Rcdr #3.	a) None	a) If Rcdrs 2 and 3 have both been recording data, ground observes that the data received when they are dumped appears to be switched if both Rcdrs are dumped at the same time.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command to restore correct channel "A" input signal routing to Rcdrs 2 and 3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) There is a loss of the "A" channel (data) input to Rcdr #2.	a) None	a) When Rcdr #2 is dumped, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore the channel "A" input to Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

*COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #1" (K3-188) (52-79703-61) (Continued)	L M S	a) Pole F fails open in the latch position.	a) There is a loss of the Fast Forward (FF) command to Rcdr #3 when the S170 command is in effect.	a) None	a) When the ground removes the FF command from Rcdr #3 and begins dumping the Rcdr, they observe that the tape has not advanced to the point where they thought it should be. R/T TM indicates the command was correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command and then gives the FF command for Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments and then the ground gives the FF command for Rcdr #3.	b) IIIb	
	L M S	a) Latch coil fails open.	a) When the ground switches from the S171 DCS command to the S170 command, Relay K3-188 does not latch. This results in the following: o Rcdr #3 FF Command goes to Rcdr #2. o Rcdr #3 channel "A" input goes to Rcdr #2. o Rcdr #2 channel "A" input goes to Rcdr #3. o Rcdr #3 clock input signal goes to Rcdr #2. o Rcdr #2 clock input signal goes to Rcdr #3.	a) None	a) If Rcdrs 2 and 3 have both been recording data, ground observes that the data received when they are dumped appears to be switched if both Rcdrs are dumped at the same time.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore correct channel "A" input signal routing to Rcdrs 2 and 3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #1" (K3-188) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the latch position.	a) There is a loss of the "A" channel (data) input to Rcdr #3.	a) None	a) When Rcdr #3 is dumped, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore the channel "A" input to Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) There is a loss of the clock input signal to Rcdr #2. This results in a loss of data recording capability on Rcdr #2. Voice recording on Rcdr #2 is not affected.	a) None	a) When Rcdr #2 is dumped, meaningless data is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The crew or the ground can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore the clock signal to Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole B fails open in the latch position.	a) There is a loss of the clock input signal to Rcdr #3. This results in a loss of data recording capability on Rcdr #3. Voice recording on Rcdr #3 is not affected.	a) None	a) When Rcdr #3 is dumped, meaningless data is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore the clock signal to Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #2" (K3-189) (52-79703-61) 3.4.25 This relay is used for DCS control of the data assignments of Rcdrs 2 and 3. S171 - Reset position S170 - Latch position	L M S	a) Pole F fails open in the reset position.	a) There is a loss of the Fast Forward (FF) command to Rcdr #3.	a) None	a) When the ground removes the FF command from Rcdr #3 and begins dumping the Rcdr, they observe that the tape has not advanced to the point where they thought it should be. R/T TM indicates the command was correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command and then gives the FF command for Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments and then the ground gives the FF command for Rcdr #3.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) There is a loss of the channel A (data) output from Rcdr #3 to the TM Xmtr.	a) None	a) When Rcdr #3 is dumped, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command to restore the lost data from Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole A fails open in the reset position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #2" (K3-189) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) There is a loss of the channel A (data) output from Rcdr #2 to the TM Xmtr.	a) None	a) When Rcdr #2 is dumped, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command to restore the lost data from Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) There is a loss of power to the latch coil (ON) of the Rcdr #2 Power Relays. Power is not supplied to Rcdr #2 for recording or dumping data.	a) When the crew attempts to record that data which is to be recorded on Rcdr #2, the "RECORD" light associated with the switch does not come ON.	a)(1) When the ground attempts to record data on Rcdr #2, R/T TM indicates there is no tape motion (K509). (2) When the ground dumps Rcdr #2, data or data and voice are not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. AM "RECORD" lights on Panel 204 test good. (3) Crew informs ground of the anomaly.	b)(1) Ground uses the S170 DCS command to restore power to the latch coil of the Rcdr #2 Power Relays, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	M	a) Pole B fails open in the reset position.	a) There is a loss of the channel "B" (voice) output signal from Rcdr #2 to the TM Xmtr.	a) None	a) When the ground dumps Rcdr #2, voice is not received. Only the Xmtr carrier wave is received. Data from Rcdr #2 is not affected.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The crew or the ground can perform switching to circumvent the problem.	b) None	b)(1) Ground requests that the crew manually control the Rcdr data assignments so that Rcdr #2 voice can be dumped. (2) Ground then uses the S170 DCS command to interchange Rcdr #2 and Rcdr #3 data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #2" (K3-189) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) When the ground switches from the S170 command to the S171 command, Relay K3-189 does not reset. This results in the following: o Rcdr #3 FF command goes to Rcdr #2. o Rcdr #2 channel "A" output is routed to Xmtr for Rcdr #3 channel "A" output. o Rcdr #3 channel "A" output is routed to Xmtr for Rcdr #2 channel "A" output. o Rcdr #3 channel "B" output is routed to Xmtr for Rcdr #2 channel "B" output. o Power for the latch coil (ON) of the Rcdr #2 Power Relays is supplied to the latch coil (ON) of the Rcdr #3 Power Relays.	a) When the crew attempts to record that data which is to be recorded on Rcdr #2, the "RECORD" light associated with the switch does not come ON.	a)(1) When the ground attempts to record data on Rcdr #2, R/T TM indicates Rcdr #3 has tape motion but Rcdr #2 does not have tape motion. (2) When the ground dumps Rcdrs 2 and 3, Rcdr 3 data (or data and voice) is received from the Xmtr(s) intended for Rcdr 2. Rcdr #2 data is not received. The carrier wave is received from the Xmtr intended for Rcdr #3 but without a data signal.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. The ground or the crew can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207 to test affected "RECORD" light. (3) Crew informs ground of the anomaly.	b)(1) Ground uses the S170 DCS command to correct the problem, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole F fails open in the latch position.	a) There is a loss of the Fast Forward (FF) command to Rcdr #2.	a) None	a) When the ground removes the FF command from Rcdr #2 and begins dumping the Rcdr, they observe that the tape has not advanced to the point where they thought it should be. R/T TM indicates the command was correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command and then gives the FF command for Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments and then the ground gives the FF command for Rcdr #2.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #2" (K3-189) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the latch position.	a) There is a loss of the channel A (data) output from Rcdr #3 to the TM Xmtr.	a) None	a) When Rcdr #3 is dumped, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore the lost data from Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) There is a loss of the channel A (data) output from Rcdr #2 to the TM Xmtr.	a) None	a) When Rcdr #2 is dumped, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates there is tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The ground or the crew can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore the lost data from Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) There is a loss of power to the latch coil (ON) of the Rcdr #3 Power Relays. Power is not supplied to Rcdr #3 for recording or dumping data.	a) When the crew attempts to record that data which is to be recorded on Rcdr #3, the "RECORD" light associated with the switch does not come ON.	a)(1) When the ground attempts to record data on Rcdr #3, R/T TM indicates there is no tape motion (K510). (2) When the ground dumps Rcdr #3, data or data and voice are not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. AM "RECORD" lights on Panel 204 test good. (3) Crew informs ground of the anomaly.	b)(1) Ground uses the S171 DCS command to restore power to the latch coil of the Rcdr #3 Power Relays, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #2" (K3-189) (52-79703-61) (Continued)	M	a) Pole 1 fails open in th latch position.	a) There is a loss of the channel "B" (voice) output signal from Redr #3 to the TM Xmtr.	a) None	a) When the ground dumps Redr #3, voice is not received. Only the Xmtr carrier wave is received. Data from Redr #3 is not affected.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The crew or the ground can perform switching to circumvent the problem.	b) None	b)(1) Ground requests that the crew manually control the Redr data assignments so that Redr #3 voice can be dumped. (2) Ground then uses the S171 DCS command to interchange Redr #2 and Redr #3 data assignments.	b) IIIb	
	L M S	a) latch coil fails open.	a) When the ground switches from the S170 command to the S171 command, Relay K3-189 does not reset. This results in the following: o Redr #2 PF command goes to Redr #3. o Redr #2 channel "A" output is routed to Xmtr for Redr #3 channel "A" output. o Redr #3 channel "A" output is routed to Xmtr for Redr #2 channel "A" output. o Redr #2 channel "B" output is routed to Xmtr for Redr #3 channel "B" output. o Power for the latch coil (ON) of the Redr #3 Power Relays is supplied to the latch coil (ON) of the Redr #2 Power Relays.	a) When the crew attempts to record that data which is to be recorded on Redr #3, the "RECORD" light associated with the switch does not come ON.	a)(1) When the ground attempts to record data on Redr #3, R/T TM indicates Redr #2 has tape motion but Redr #3 does not have tape motion. (2) When the ground dumps Redrs 2 and 3, Redr 2 data (or data and voice) is received from the Xmtr(s) intended for Redr 3. Redr #3 data is not received. The carrier wave is received from the Xmtr intended for Redr #2 but without a data signal.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. The ground or the crew can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207 to test affected "RECORD" light. (3) Crew informs ground of the anomaly.	b)(1) Ground uses the S171 DCS command to correct the problem, or (2) Ground requests that the crew manually control the Redr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #3" (K3-190) (52-79703-61) 3.4.26 This relay is used for DCS control of the data assignments of Rcdrs 2 and 3. S171 - Reset position S170 - Latch position	L M S	a) Pole F fails open in the reset position.	a) There is a loss of the Rcdr #2 tape motion signal (+4 volts) for Tape Recorder running indication on the "RECORD" indicator lights.	a) When the crew attempts to record that data which is to be recorded on Rcdr #2, the "RECORD" light associated with the switch does not come ON.	a) None. TM indication of tape motion is not affected.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The crew or the ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The AM "RECORD" lights test good. (3) Crew informs ground of the anomaly.	b)(1) Ground verifies that Rcdr has tape motion. (2) Ground uses the S170 DCS command to restore power for turning on the affected "RECORD" light(s), or (3) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) There is a loss of power for cycling the Rcdr #3 Power Relays to the reset (OFF) position. This results in the Rcdr being powered-up whenever its bus is powered-up.	a)(1) The Rcdr has an audio indication that it is running. (2) If the end-of-tape is reached, the Rcdr #3 "STOP" light on Panel 204 comes ON.	a) R/T TM indicates that Rcdr #3 has tape motion whenever its bus is powered-up.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The crew or the ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breaker of associated equipment which could cause the anomaly.	b)(1) Ground uses the S170 DCS command to restore power for resetting the affected Rcdr #3 Power Relays, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #3" (K3-190) (52-79703-51) (Continued)	L M S	a) Pole D fails open in the reset position.	a) There is a loss of power for cycling the Redr #3 Power Relays to the latch (ON) position. This results in power not being supplied to Redr #3 for recording or dumping data.	a)(1) When the crew attempts to record that data which is to be recorded on Redr #3, the "RECORD" light associated with the switch does not come ON. (2) There is no audio indication that Redr #3 is running.	a) When the ground dumps Redr #3, only the Xmtr(s) carrier wave is received. R/T TM indicates the Redr has no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good.	b)(1) Ground uses the S170 DCS command to restore power to the latch coils of the affected relays, or (2) Ground requests that the crew manually control the Redr data assignments.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) There is a loss of the Playback (PB) command to Redr #3. This results in a loss of capability to dump data from Redr #3.	a) None	a) When the ground gives the dump execute command, data is not received from Redr #3. Only the Xmtr carrier wave is received. R/T TM indicates the dump execute command was correctly received and decoded by the DCS and that Redr #3 has tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S170 DCS command to restore the PB command to Redr #3, or (2) Ground requests that the crew manually control the Redr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #3" (K3-190) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) When the ground swtiches from the S170 command to the S171 command, Relay K3-190 does not reset. This results in the following: o Loss of Rcdr #2 tape motion signal for panel indicator lights. o Power to Rcdr #3 Power Relay latch coils goes to Rcdr #2 Power Relay latch coils. o Power to Rcdr #3 Power Relay reset coils goes to Rcdr #2 Power Relay reset coils. o Rcdr #3 PB command goes to Rcdr #2. o Rcdr #2 PB command goes to Rcdr #3.	a)(1) When the crew attempts to record data on Rcdr #2, the Exp 2 "RECORD" light comes ON. If S155 DCS command is in effect, the Exp 1 "RECORD" light also comes ON. (2) When the crew attempts to record data on Rcdr #3, there is no tape motion indication on the "RECORD" lights.	a)(1) When the ground attempts to record or dump data with Rcdr #2, R/T TM indicates that Rcdr #3 has tape motion. (2) When the ground attempts to record or dump data with Rcdr #3, R/T TM indicates that Rcdr #2 has tape motion.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b)(1) Ground uses the S170 DCS command. This restores normal Rcdr operation, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) There is a loss of the Playback (PB) command to Rcdr #2. This results in a loss of capability to dump data and voice from Rcdr #2.	a) None	a) When the ground gives the dump execute command, data is not received from Rcdr #2. Only the Xmtr carrier wave is received. R/T TM indicates the dump execute command was correctly received and decoded by the DCS and that Rcdr #2 has tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore the PB command to Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #3" (K3-190) (52-72703-61) (Continued)	L M S	a) Pole F fails open in the latch position.	a) There is a loss of the Rcdr #3 tape motion signal (+4 volts) for Tape Recorder running indication on the "RECORD" indicator lights.	a) When the crew attempts to record that data which is to be recorded on Rcdr #3, the "RECORD" light associated with the switch does not come ON.	a) None. TM indication of tape motion is not affected.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The crew or the ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" light on Panel 207. "RECORD" lights on Panel 204 test good. (3) Crew informs ground of the anomaly.	b)(1) Ground verifies that Rcdr has tape motion. (2) Ground uses the S171 DCS command to restore power for turning on the affected "RECORD" light(s), or (3) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) There is a loss of power for cycling the Rcdr #2 Power Relays to the reset (OFF) position. This results in the Rcdr being powered-up whenever its bus is powered-up.	a)(1) The Rcdr has an audio indication that it is running. (2) If the end-of-tape is reached, the Rcdr #2 "STOP" light on Panel 204 comes ON.	a) R/T TM indicates that Rcdr #2 has tape motion whenever its bus is powered-up.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The crew of the ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breaker of associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b)(1) Ground uses the S171 DCS command to restore power for resetting the affected Rcdr #2 Power Relays, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #3" (K3-190) (52-79703-61)	L M S	a) Pole D fails open in the latch position.	a) There is a loss of power for cycling the Rcdr #2 Power Relays to the latch (ON) position. This results in power not being supplied to Rcdr #2 for recording or dumping data.	a)(1) When the crew attempts to record that data which is to be recorded on Rcdr #2, the "RECORD" light associated with the switch does not come ON. (2) There is no audio indication that Rcdr #2 is running.	a) When the ground dumps Rcdr #2, only the Xmtr(s) carrier wave is received. R/T TM indicates the Rcdr has no tape motion.	a) N/A	---
(Continued)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b)(1) Ground uses the S171 DCS command to restore power to the latch coils of the affected relays, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole B fails open in the latch position.	a) There is a loss of the Playback (PB) command to Rcdr #3. This results in a loss of capability to dump data and voice from Rcdr #3.	a) None	a) When the ground gives the dump execute command, data is not received from Rcdr #3. Only the Xmtr carrier wave is received. R/T TM indicates the dump execute command was correctly received and decoded by the DCS and that Rcdr #3 has tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore the PB command to Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #3" (K3-190) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) When the ground switches from the S171 command to the S170 command, Relay K3-190 does not latch. This results in the following: o Loss of Rcdr #3 tape motion signal for panel indicator lights. o Power to Rcdr #2 Power Relay latch coils goes to Rcdr #3 Power Relay latch coils. o Power to Rcdr #2 Power Relay reset coils goes to Rcdr #3 Power Relay reset coils. o Rcdr #3 PB command goes to Rcdr #2. o Rcdr #2 PB command goes to Rcdr #3.	a)(1) When the crew attempts to record data on Rcdr #3, the Exp 2 "RECORD" light comes ON. If S155 DCS command is in effect, the Exp 1 "RECORD" light also comes ON. (2) When the crew attempts to record data on Rcdr #2, there is no tape motion indication on the "RECORD" lights.	a)(1) When the ground attempts to record or dump data with Rcdr #2, R/T TM indicates that Rcdr #3 has tape motion. (2) When the ground attempts to record or dump data with Rcdr #3, R/T TM indicates that Rcdr #2 has tape motion.	a) N/A	---
		b) Defective wire terminal due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b)(1) Ground uses the S171 DCS command. This restores normal Rcdr operation, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole C fails open in the latch position.	a) There is a loss of the Playback (PB) command to Rcdr #2. This results in a loss of capability to dump data and voice from Rcdr #2.	a) None	a) When the ground gives the dump execute command, data is not received from Rcdr #2. Only the Xmtr carrier wave is received. R/T TM indicates the dump execute command was correctly received and decoded by the DCS and that Rcdr #2 has tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b)(1) Ground uses the S171 DCS command to restore the PB command to Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, Recorder 2/3 Select DCS Control Relay #4" (K3-326) (52-79703-61) 3.4.27	L M S	a) Pole F fails open in the reset position.	a) This pole is functional only as a back-up when Rcdr #3 is switched from Bus B to Bus A or vice versa.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) This pole is functional only as a back-up when Rcdr #2 is switched from Bus B to Bus A or vice versa.	a) None	a) None	a) N/A	---
This relay is used for DCS control of the data assignments of Rcdrs 2 and 3. S171 - Reset position S170 - Latch position		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) When the S154 DCS command is in effect, there is a loss of power to the latch coil (ON) of the Rcdr #2 Power Relays. Power is not supplied to Rcdr #2.	a) When the crew attempts to record that data which is to be recorded on Rcdr #2, the "RECORD" light associated with the switch does not come ON.	a) When the ground attempts to dump Rcdr #2, data or data and voice are not received. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The AM "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b)(1) Ground uses the S170 DCS command to restore power to Rcdr #2, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole A fails open in the reset position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) When the crew or the ground removes the command which requires Rcdr #2, there is a loss of power to the reset (OFF) coils of Rcdr #2 Power Relays. Rcdr #2 will be powered up whenever its bus is powered-up.	a) If the end-of-tape is reached, the Rcdr #2 "STOP" light (on Panel 204) comes ON.	a)(1) R/T TM indicates that Rcdr #2 has tape motion even though it is supposedly powered-down.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #4" (K3-326) (52-79703-61) (Continued)	L M S	b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew informs the ground of the anomaly.	b)(1) Ground uses the S170 DCS command to restore capability to reset the Rcdr #2 Power Relays, or (2) Ground requests that the crew manually control the Rcdr data assignments, (3) Ground uses the PCM Bus Select commands to reset the Rcdr #2 Power Relays.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) There is a loss of the Rcdr #3 tape motion signal (+4 volts) for Tape Rcdr running indication on the "RECORD" indicator lights.	a) When the crew attempts to record that data which is to be recorded on Rcdr #3, the "RECORD" light associated with the switch does not come ON.	a) None. TM indication of tape motion is not affected.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207 The "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b)(1) Ground uses the S170 DCS command, which restores power to the "RECORD" lights, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Reset coil fails open.	a) When the ground switches from the S170 DCS command to the S171 command, Relay K3-326 does not reset. This results in the following effects: 1) With the S154 DCS command also in effect, when the crew or ground attempts to power up the Data Rcdr, Rcdr #3 is powered-up (from the PCM Bus) instead of Rcdr #2. Rcdr #3 cannot be powered from Exp Rcdr Bus. 2) With the S155 DCS command also in effect, the Exp 2 Rcdr cannot be powered-up unless the Exp 1 Rcdr is already powered-up.	a)(1) With the S154 DCS command in effect, if the crew switches the "DATA" switch to the "RECORD" position, the Data "RECORD" light on Panel 204 does not come ON. If Exp 1 switch is switched to the "RECORD" position, the Exp 1 "RECORD" lights come ON. If Exp 2 switch is switched to the "RECORD" position, the Exp 2 "RECORD" lights do not come ON. (2)With the S155 DCS command in effect, if the Exp 2 (but not the Exp 1) switch is switched to the "RECORD" position, the Exp 2 "RECORD" lights do not come ON. If the Exp 1 and Exp 2 switches are both in the "RECORD" position, the Exp 1 and Exp 2 "RECORD" lights come ON.	a)(1) With the S154 DCS command in effect, when the ground attempts to use the Data Rcdr, there is indication on R/T TM that Rcdr #3 has tape motion instead of Rcdr #2. (2)With the S155 DCS command in effect, ground finds they cannot dump the Exp 2 recorder-unless the Exp 1 Rcdr is already recording or dumping data.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #4" (K3-326) (52-79703-61) (Continued)	L M S	b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment which (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b)(1) Ground returns to the S170 DCS command, or, (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole E fails open in the latch position.	a) This pole is functional only as a back-up when Rcdr #3 is switched from Bus B to Bus A or vice versa.	a) None	a) None	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole F fails open in the latch position.	a) This pole is functional only as a back-up when Rcdr #2 is switched from Bus B to Bus A or vice versa.	a) None	a) None	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None		
	L M S	a) Pole D fails open in the latch position.	a) When the S154 DCS command is in effect, there is a loss of power to the latch coil (ON) of the Rcdr #3 Power Relays. Power is not supplied to Rcdr #3.	a) When the crew attempts to record that data which is to be recorded on Rcdr #3, the "RECORD" light associated with the switch does not come ON.	a) When the ground attempts to dump Rcdr #3, data or data and voice are not received. On the carrier wave is received from the Xmtr(s). R/T TM indicates there is no tape motion.	a) N/A	—
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The AM "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b)(1) Ground uses the S171 DCS command to restore power to Rcdr #3, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #4" (K3-326) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the latch position.	a) When the crew or the ground removes the command which requires Rcdr #3, there is a loss of power to the reset (OFF) coils of Rcdr #3 Power Relays. Rcdr #3 will be powered-up whenever its bus is powered-up.	a) If the end-of-tape is reached the Rcdr #3 "STOP" light (on Panel 204) comes ON.	a)(1) R/T TM indicates that Rcdr #3 has tape motion even though it is supposedly powered-down.	a] N/A	—
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew informs the ground of the anomaly.	b)(1) Ground uses the S171 DCS command to restore capability to reset the Rcdr #3 Power Relays, or (2) Ground requests that the crew manually control the Rcdr data assignments, (3) Ground uses the PCM Bus Select commands to reset the Rcdr #3 Power Relays.	b] IIIb	
	L M S	a) Pole B fails open in the latch position.	a) There is a loss of the Rcdr #2 tape motion signal (+4 volts) for the Tape Rcdr running indication on the "RECORD" indicator lights.	a) When the crew attempts to record that data which is to be recorded on Rcdr #2, the "RECORD" light associated with the switch does not come ON.	a) None. TM indication of tape motion is not affected.	a] N/A	—
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b)(1) Ground uses the S171 DCS command which restores power to the "RECORD" lights, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b] IIIb	
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #4" (K3-326) (52-79703-61) (Continued)	L M S	a) Latch coil fails open.	a) When the ground switches from the S171 DCS command to the S170 command, Relay K3-326 does not reset. This results in the following effects: 1) With the S154 DCS command also in effect, when the crew or ground attempts to power-up the Data Rcdr, the Exp 2 Rcdr (Rcdr #2) is powered-up from the PCM Bus. When the crew or the ground attempts to power-up the Exp 2 Rcdr, the	a)(1) With the S154 DCS command in effect, when the crew switches the "DATA" switch to the "RECORD POSITION", the Data 'RECORD' light (on Panel 204) does not come ON. When the ground switches on Exp 2 switch to the "RECORD" position, the Exp 2 "RECORD" lights do not come ON. Rcdr #2 emits sounds indicating it is operating only if Data Rcdr ON commands are given.	a)(1) With the S154 DCS command in effect, when the ground attempts to use the Data Rcdr for recording or dumping data, R/T TM indicates that Rcdr #2 has tape motion instead of Rcdr #3. When the ground attempts to use the Exp 2 Rcdr while the Data Rcdr OFF commands are in effect, R/T TM indicates that the Exp 2 Rcdr (Rcdr #2) has no	a] N/A	—

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 2/3 Select DCS Control Relay #4" (K3-326) (52-79703-61) (Continued)	L M S	a) (Cont'd.)	a)1)(Cont'd.) Rcdr #2 Power Relays for Exp Rcdr Bus power will not latch up since there is also power applied to the reset coil of these relays. The Exp 1 Rcdr is not affected by the failure.		a)(1)(Cont'd.) tape motion.		
			2)With the S155 DCS command also in effect, when the crew or ground attempts to power-down the Exp 1 Rcdr (Rcdr #3), the OFF command goes to the reset coil of the Exp 2 Rcdr (Rcdr #2) Power Relays, thus removing power from the Exp 2 Rcdr. The Exp 1 Rcdr does not turn OFF unless the Exp 2 Rcdr is turned-OFF which removes power from the Exp Rcdr Bus.	2) With the S155 DCS command in effect, when the crew switches an Exp 1 switch to the "RECORD" position, the Exp 1 "RECORD" lights come ON. If the ground then switches an Exp 2 switch to the "RECORD" position, the Exp 2 "RECORD" lights do not come ON. Audio indication is that Rcdr 2 and 3 are operating.	(2) With the S155 DCS command in effect, when the ground attempts to power down the Exp 1 Rcdr (Rcdr #3), R/T TM indicates that the Exp 2 Rcdr (Rcdr #3) has turned OFF. If the Exp Rcdr Bus is still powered-up, R/T TM indicates the Exp 1 Rcdr still has tape motion.		
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b)(1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly.	b)(1) Ground uses the S171 DCS command to restore normal operation, or	b) IIIb	
				(2)Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good.	(2) Ground requests that the crew manually control the Rcdr data assignments.		
				(3)Crew informs the ground of the anomaly.			

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #1" (K3-178) (52-79703-61) 3.4.28	L M S	a) Pole B fails open in the reset (or latch) position.	a) There is a loss of the Clock input signal to the Data Rcdr. This results in a loss of recorded subframe 1 but does not affect Voice recording capability.	a) None	a) When the ground dumps the Data Rcdr, meaningless data is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command to restore the Clock signal to the Data Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
This realy is used for DCS control of Rcdrs 1 and 2 data assignments.	M	a) Pole C fails open in the reset (or latch) position.	a) There is a loss of the clock input signal to the Exp 1 Rcdr. This results in a loss of recorded data from the Exp 1 Rcdr. Voice recording capability is not affected.	a) None	a) When the ground dumps the Exp 1 Rcdr, meaningless data is received.	a) N/A	---
S155 - Reset Position		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command to restore the clock signal to the Exp 1 Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
S154 - Latch Position	L M S	a) Pole D fails open in the reset (or latch) position.	a) There is a loss of the data (Subframe 1) input signal to the Data Rcdr. Voice recording capability on the Data Rcdr is not affected.	a) None	a) When the ground dumps the Data Rcdr, data (subframe 1) is not receive, only the Xmtr carrier wave is received.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command to restore the data signal to the Data Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #1" (K3-178) (52-79703-61) (Continued)	M	a) Pole E fails open in the reset (or latch) position.	a) There is a loss of the data input signal to the Exp 1 Rcdr. Voice input to the Rcdr is not affected.	a) None	a) When the ground dumps the Exp 1 Rcdr, data is not received. Only the Xmtr carrier wave is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command to restore the data input signal to the Exp 1 Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole F fails open in the reset (or latch) position.	a) This is a loss of the Fast Forward command to the Data Rcdr. The Data Rcdr cannot be fast forwarded if the ground has had trouble acquiring the Xmtr carrier wave when the Rcdr is dumped.	a) None	a) After the Data Rcdr has supposedly been fast forwarded, ground observes that the data received is not from the point in the tape where they thought it should be. TM channel K322, indicates the command was correctly received and decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command to restore the Fast Forward command signal to the Data Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

*COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #1" (K3-178) (52-79703-61) (Continued)	L M S	a) Latch (or reset) coil fails open.	a) When the ground gives the S154 (or S155) command, Relay K3-178 does not cycle to the latch (or reset) position. The result or the failure to latch is as follows: o Data Rcdr clock input goes to the Exp 1 Rcdr, and vice versa. o Data input to the data Rcdr goes to the Exp 1 Rcdr, and vise versa. o The Data Rcdr Fast Forward command goes to the Exp 1 Rcdr.	a) None	a) (1) When the ground dumps the Data Rcdr, Exp 1 data is received instead of subframe 1. Voice is received as expected. (2) When the ground dumps the Exp 1 Rcdr, Data (subframe 1) is received instead of Exp 1 data. Exp Voice is received as expected. (3) When the ground gives the Data Rcdr Fast Forward command (2-1), the Data Rcdr does not advance to the point in the tape where the ground estimates they will be. If the Exp 1 Rcdr is powered-up, when the ground dumps the Exp 1 Rcdr they receive questionable data because the Exp 1 Rcdr has been fast forwarded.	a) N/A	----
		b) Defective wire or terminal due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) The ground gives the S155 (or S155) command, or (2) The ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #2" (K3-179) (52-79703-61) 3.4.29	M	a) Pole B fails open in the reset (or latch) position.	a) There is a loss of the Exp voice output signal to the TM Xmtr. The Exp 1 data output signal is not affected.	a) None	a) When the ground dumps Exp 1 & Exp Voice, Exp Voice is not received. Only the Xmtr's carrier wave is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent to problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command and then uses the Data & Voice dump command since what was the Exp 1 Rcdr becomes the Data Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	M	a) Pole C fails open in the reset (or latch) position.	a) There is a loss of the voice output signal from the Data Rcdr to the TM Xmtr.	a) None	a) When the ground dumps Data & Voice, Voice is not received. Only the Xmtr's carrier wave is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command and then uses the Exp 1 & Exp voice dump command since what was the Data Rcdr becomes the Exp 1 Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole A fails open in the reset (or latch) position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #2" (K3-179) (Continued)	M	a) Pole D fails open in the reset (or latch) position.	a) There is a loss of the data output signal from the Exp 1 Rcdr to the TM Xmtr. The Exp Voice output is not affected.	a) None	a) When the ground dumps the Exp 1 Rcdr, data is not received. Only the Xmtr's carrier wave is received.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command and then uses the Data & Voice dump command since what was the Exp 1 Rcdr is now the Data Rcdr. This is done to obtain previously recorded Exp 1 & Exp Voice, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole E fails open in the reset (or latch) position.	a) There is a loss of the data output signal from the Data Rcdr to the TM Xmtr. The Voice output is not affected.	a) None	a) When the ground dumps the Data Rcdr, data (subframe 1) is not received. Only the Xmtr's carrier wave is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154(or S155) DCS command and then uses the Exp 1 & Exp Voice dump command since what was the Data Rcdr becomes the Exp 1 Rcdr. This is done to obtain previously recorded data. (subframe 1) or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #2" (K3-179) (52-79703-61) (Continued)	M	a) Pole F fails open in the reset (or latch) position.	a) There is a loss of the Fast Forward command signal to the Exp 1 Rcdr. The Exp 1 Rcdr cannot be fast forwarded if the ground has had trouble acquiring the Xmtr carrier wave when the Rcdr is dumped.	a) None	a) After the Exp 1 Rcdr has supposedly been fast forwarded, ground observes that the data received is not from the point in the tape where they thought it should be. TM channel K346 indicates the command was correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (S155) DCS command to restore the Fast Forward command signal to the Exp 1 Rcdr. If the ground wishes to again fast forward the Exp 1 Rcdr to recover Exp 1 data from prior to the S154 command, they must use the Data Rcdr Fast Forward command since, what was the Exp 1 Rcdr is now the Data Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW c) INDICATION d) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #2" (K3-179) (52-79703-61) (Continued)	L M S	a) Latch (or reset) coil fails open.	a) When the ground gives the S154 (or S155) command, Relay K3-179 does not cycle to the latch (or reset) position. The result of the failure to latch (or reset) is as follows: o The Exp 1 Rcdr Exp Voice output goes to the TM Xmtr which is designated for Voice from the Data Rcdr, and vice versa. o The Exp 1 Rcdr data output goes to the TM Xmtr which is designated for the data output from the Data Rcdr, and vice versa. o The Exp 1 Rcdr Fast Forward command goes to the Data Rcdr.	a) None	a) (1) If the ground gives the necessary commands to dump Data, Exp 1 & Exp Voice, they observe the following: o The Data Rcdr data is received from the Xmtr which is designated for Exp 1 data, and vice versa. o Voice is received from the Exp Voice Xmtr. Ground may or may not be able to distinguish between the two. (2) If the ground gives the necessary commands for R/T TM, Exp 1 and Exp Voice, neither Exp 1 data nor Exp Voice is received. Only the carrier wave of the Xmtrs is received. (3) When the ground attempts to dump Data & Voice, neither is received. Only the carrier wave of the Xmtrs is received.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) The ground gives the S155 (or S154) DCS command, or (2) The ground results that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder, 1/2 Select DCS Control Relay #3" (K3-180) (52-79703-61) 3.4.30		a) Pole B fails open in the reset (or latch) position.	a) There is a loss of the Playback (PB) command signal to the Exp 1 Rcdr.	a) None	a) When the ground attempts to dump the Exp 1 Rcdr, data and voice are not received. Only the carrier wave of the Xmtrs is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command and then uses the Data & Voice dump command since what was the Exp 1 Rcdr is now the Data Rcdr. This is used to dump what was recorded prior to the S154 (or S155) command, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
		a) Pole C fails open in the reset (or latch) position.	a) There is a loss of the Playback (PB) command signal to the Data Rcdr.	a) None	a) When the ground attempts to dump the Data Rcdr, data or data and voice are not received. Only the carrier wave of the Xmtr(s) is received.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground uses the S154 (or S155) DCS command and then uses uses the Exp 1 & Exp Voice dump commands since what was the Data Rcdr is now the Exp 1 Rcdr. This is used to dump what was recorded prior to the S154 (or S155) command, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select CDS Control Relay #3" (K3-180) (52-79703-61) (Continued)	M	a) Pole D fails open in the reset (or Latch) position.	a) When the crew and ground remove all commands for using the Exp 1 Rcdr, power is not supplied to the reset coils of the Exp 1 Rcdr Power Relays. The Exp 1 Rcdr is powered-up whenever the Exp Rcdr Bus is powered-up.	a) If the end-of-tape is reached, the Exp 1 Rcdr "STOP" light (on panel 204) comes ON.	a) (1) When the ground commands the Exp 1 Rcdr OFF, R/T TM indicates the Exp 1 Rcdr still has tape motion if the Exp Rcdr Bus is powered-up.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew informs the ground of the anomaly.	b) (1) Ground can use the recorder select DCS commands or the PCM Bus select commands to reset the affected relays, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole E fails open in the reset (or latch) position.	a) None, provided the Rcdrs are powered-down prior to switching them from Bus A to Bus B or vice versa.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) None	b) IIIb	
	M	a) Pole F fails open in the reset (or latch) position.	a) There is a loss of power for turning ON the "DATA RECORD" light on Panel 204.	a) When the crew switches the "DATA" switch to the "RECORD" position, the data "RECORD" light does not come ON.	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b) (1) Ground verifies via TM that the Data Rcdr has tape motion. (2) Ground uses the S154 (or S155) DCS command to restore the Data "RECORD" light power, or (3) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #3" (K3-180) (52-79703-61) (Continued)	L M S	a) Pole A fails open in the reset (or latch) position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
		a) Latch (or reset) coil fails open.	a) When the ground gives the S154 (or S155) DCS command, relay K3-180 does not cycle to the latch (or reset) position. The result of the failure to latch (or reset) is as follows: o The Exp 1 Rcdr Playback (PB) command goes to the Data Rcdr, and vice versa. o There is a loss of power for turning on the Data "RECORD" light on Panel 204. o The Data Rcdr cannot be turned ON as its power relays cannot be latched. o The Exp 1 Rcdr Power relays do not reset. The Exp 1 Rcdr is powered-up whenever the Exp Rcdr Bus is powered-up.	a) (1) When the crew switches the "DATA" switch to the "RECORD" position, the Data "RECORD" light (on Panel 204) does not come ON. (2) When the crew switches an "EXP 1" switch to the "OFF" position, sounds emitted from the Exp 1 Rcdr indicate it is powered-up (i.e. provided the Exp Rcdr bus is powered-up). If the end-of-tape is reached, the Exp 1 rcdr "STOP" light (on Panel 204) comes ON.	a) (1) When the ground attempts to record data on the Data Rcdr, R/T TM indicates there is no tape motion. (2) When the ground attempts to dump the Data Rcdr, Data or Data & Voice are not received. Only the carrier wave is received from the Xmtr(s). (3) When the ground gives the Exp 1 Rcdr dump execute DUMP command (31-4), Exp 1 data and Exp Voice are not received. Only the carrier wave of the Xmtrs is received. R/T TM indicates the Exp 1 Rcdr has tape motion and that the execute DUMP command was correctly received and decoded. When the ground commands Exp 1 & Exp Voice Dump enable OFF (10-2), TM indicates the Rcdr still has tape motion (i.e. provided the Exp Rcdr Bus is still powered-up and the end-of-tape has not been reached).		
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly.	b) (1) Ground uses the S155 DCS command to restore proper Rcdr Rcdr operation, or		

(Continued on next page)

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #3 (K3-180) (52-79703-61)				b) (2) Crew uses the "Lighting Status" switch on Panel 207. The "RECORD" lights (on Panel 204) test good. (3) Crew informs the ground of the anomaly.	b) (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
(Continued)	L M S	a) Reset coil fails open.	a) When the ground gives the S155 DCS command, Relay K3-180 does not cycle to the reset position. The result of the failure to reset is as follows: o The Exp 1 Rcdr Playback (PB) command goes to the Data Rcdr, and vice versa. o There is a loss of power for turning on the Data "RECORD" light on Panel 204. o The Exp 1 Rcdr cannot be turned ON as its power relays cannot be latched.	a) (1) When the crew switches an "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" lights do not come ON. Rcdr does not sound like it is running. (2) When the crew switches the "DATA" switch (on Panel 204) to the "RECORD" position, the Data "RECORD" light does not come ON. Sounds omitted from the Data Rcdr indicate that it is powered-up.	a) (1) When the ground gives the Rcdr dump execute DUMP command (15-2), data or data and Voice are not received. Only the carrier waves of the Xmtr(s) is received. R/T TM indicates the data rcdr has tape motion and that the execute DUMP command was correctly received and decoded. (2) When the ground gives the Exp 1 & Exp voice dump enable ON command (10-2), TM indicates that there is no tape motion. The carrier is no tape motion. The carrier wave of the Xmtrs is received.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING" STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b) (1) Ground uses the S154 DCS command to restore proper Rcdr operation, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #4" (K3-325) (52-79703-61) 3.4.31	M	a) Pole B fails open in the reset (or latch) position.	a) There is a loss of power for turning on the Exp 1 "RECORD" lights.	a) When the crew switches an "EXP 1" switch to the "RECORD" position, the EXP 1 "RECORD" lights do not come ON. The Rcdr emits sounds indicating it is powered-up.	a) None	a)	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent to problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. (3) Crews informs the ground of the anomaly.	b) (1) Ground uses the S154 (or S155) DCS command to restore power for turning on the Exp 1 "RECORD" lights, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
This relay is used for DCS control of RCDRS 1 and 2 data assignments. S-155 - Reset Position S-154 - Latch Position	M	a) Pole C fails open in the reset position.	a) When the crew or the ground attempts to use the Exp 1 Rcdr, power is not supplied to the latch coil of the Exp 1 Rcdr Power Relays. This results in power not being supplied to the Exp 1 Rcdr.	a) (1) When the crew switches an "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" light does not come ON. The Rcdr does not emit any sound which would indicate that it is powered-up.	a) (1) When the ground attempts to dump the Exp 1 Rcdr, Exp 1 data & Exp Voice are not received. Only the carrier wave is received from the Xmtrs. R/T TM indicates the Rcdr has no tape motion.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent to problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b) (1) Ground uses the S154 (or S155) DCS command to restore power for turning on the EXP 1 "RECORD" lights, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole F fails open in the reset (or latch) position.	a) None, provided the Rcdrs are powered-down prior to switching them from Bus A to Bus B or vice versa.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #4" (K3-325) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset (or latch) position.	a) When the crew or the ground attempts to use the Data Rcdr, power is not supplied to the latch coil of the Data Rcdr Power Relays. This results in power not being supplied to the Data Rcdr.	a) When the crew switches the "DATA" switch to the "RECORD" position, the Data "RECORD" light on Panel 204 does not come ON. The Rcdr does not emit any sound which would indicate that it is powered-up.	a) (1) When the ground attempts to record Data on the Data Rcdr, R/T TM indicates no tape motion. (2) When the ground attempts to dump the Data Rcdr, neither Data nor Voice is received. Only the carrier wave is re-received. R/T TM indicates NO tape motion and that all dump commands have been correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problm.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b) (1) Ground uses the S154 (or S155) DCS command to restore power to the Data Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	
	L M S	a) Pole E fails open in the reset (or latch) position.	a) When the crew or ground removes commands requiring the Data Rcdr, the Data Rcdr Power Relays do not reset. This results in the application of power to the Data Rcdr whenever the PCM Bus is powered-up.	a) (1) The Data Rcdr emits sounds which indicate it is running. The Data "RECORD" light (on Panel 204) turns OFF as expected.	a) (1) When the commands which require that the Data Rcdr be operating, R/T TM indicates the Rcdr still has tape motion (i.e. provided the PCM Bus is powered-up and the end-of-the tape has not been reached).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problm.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) (1) Ground uses the S154 (or S155) DCS command to restore power to the Data Rcdr, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder 1/2 Select DCS Control Relay #4" (K3-325) (52-79703-61) (Continued)	L M S	a) Pole A fails open in the reset (or latch) position	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) When the ground gives the S154 DCS command, Relay K3-325 does not latch. This results in the following: o Power is supplied to Rcdr #1 instead of the Data Rcdr when commands requiring Data Rcdr usage are given. (Rcdr #1 is the Exp 1 Rcdr). o When commands requiring Exp 1 Rcdr usage are given, no Rcdr turns ON. o The Exp 2 Rcdr is not affected.	a) (1) When the crew switches the "DATA" switch to the "RECORD" position, the Data "RECORD" light on Panel 204 does not come ON. Sounds emitted from Rcdr #1 (the Exp 1 Rcdr) indicate it is running. The Data Rcdr does not sound like it is running. (2) When the crew switches an "EXP 1" switch to the "RECORD" position, the Exp 1 "RECORD" light does not come ON. The Exp 1 Rcdr does not sound like it is running.	a) (1) When the ground attempts to record Data (subframe 1) on the Data Rcdr, R/T TM indicates the Data Rcdr has no tape motion but that the Exp 1 Rcdr has tape motion. (2) When the ground attempts to dump the Data Rcdr, Data or Data & Voice are not received. Only the carrier wave is received from the Xmtr(s). R/T TM indicates the Exp 1 Rcdr has tape motion and the dump commands have been correctly received and decoded by the DCS.		
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b) (1) Ground uses the S155 DCS command to restore proper Rcdr operation, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder 1/2 Select DCS Control Relay #4" (K3-325) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) When the ground gives the S155 DCS command, Relay K3-325 does not reset. This results in the following: o When commands requiring Data Rcdr usage, no Rcdr turns ON. o When commands requiring Exp 1 Rcdr usage are given, the Data Rcdr (Rcdr #1) turns ON. The Exp 1 Rcdr OFF commands do not turn the Data Rcdr OFF. o The Exp 2 Rcdr is not affected.	a) (1) When the crew switches the "DATA" switch to the "RECORD" position, the Data "RECORD" light on Panel 204 does not come ON. (2) When the crew switches an Exp 1 switch to the "RECORD" position, the Data and Exp 1 "RECORD" lights turn ON. The Data Rcdr (Rcdr #1) emits sounds indicating that it is running.	a) (1) When the ground attempts to record Data on the Data Rcdr, R/T TM indicates the Data Rcdr has no tape motion. (2) When the ground attempts to dump the Data Rcdr, Data or Data and Voice are not received. Only the carrier wave is received from the Xmtr(s). R/T TM indicates the Data Rcdr has no tape motion and the dump commands have been correctly received and decoded by the DCS. (3) When the ground attempts to dump the Exp 1 Rcdr, Exp 1 data and Exp Voice carrier wave is received from the Xmtrs. R/T TM indicates that the Data Rcdr has tape motion while the Exp 1 Rcdr has no tape motion and that the dump commands have been correctly received and decoded by DCS.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING" STATUS" switch on Panel 207. The "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b) (1) Ground uses the S154 DCS command to restore proper Rcdr operation, or (2) Ground requests that the crew manually control the Rcdr data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #1" (K3-301) (52-79703-61)	M	a) Pole F fails open in the reset (or latch) position.	a) There is a loss of the subframe 2 data (-) from the Exp 1 Rcdr to the Pgmr. This results in a loss of recorded subframe 2 data.	a) None	a) When the ground dumps the Exp 1 Rcdr, subframe 2 data is not received.	a) N/A	-----
3.4.32		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	
	M	a) Pole E fails open in the reset (or latch) position.	a) There is a loss of the subframe 2 data input from the Pgmr to the Exp 1 Rcdr. This results in a loss of recorded subframe 2 data.	a) None	a) When the ground dumps the Exp 1 Rcdr, subframe 2 data is not received.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	
	L M S	a) Pole D fails open in the reset (or latch) position.	a) There is a loss of the subframe 3/subframe 4 data (-) from the Exp 2 Rcdr to the Pgmr.	a) None	a) When the ground dumps the Exp 2 Rcdr, subframe 3 and subframe 4 data is not received.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	
	L M S	a) Pole C fails open in the reset (or latch) position.	a) There is a loss of the subframe 3/subframe 4 data input from the Pgmr to the Exp 2 Rcdr.	a) None	a) When the ground dumps the Exp 2 Rcdr, subframe 3 and subframe 4 data is not received.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #1" (K3-301) (52-79703-61) (Continued)	L M S	a) Pole B fails open in the reset (or latch) position.	a) None - This pole is a spare.	a) None	a) None	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset (or latch) position.	a) None - GSE use only	a) None	a) None	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil (or latch coil) fails open.	a) When the ground gives the S275 (or S274) DCS command, there is a loss of the following signals: o Subframe 2 data (-) from the Exp 1 Rcdr to the Pgmr. o Subframe 2 data input from the Pgmr to the Exp 1 Rcdr. o Subframe 3/subframe 4 data (-) from the Exp 2 Rcdr to the Pgmr. o Subframe 3/subframe 4 data input from the Pgmr to the Exp 2 Rcdr.	a) None	a) Ground observes a loss of recorded subframes 2, 3 & 4. Recorded subframe 1, recorded M-509/T013 Experiment data, recorded Voice and Exp Voice, and R/T TM are not affected.	a) N/A	
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #4" (K3-306) (52-79703-61)	M	a) Pole F fails open in the reset (or latch) position.	a) There is a loss of the subframe 2 data (↑) input to the Exp 1 Rcdr. This results in a loss of recorded subframe 2 data.	a) None	a) When the ground dumps the Exp 1 Rcdr, subframe 2 data is not received.	a) N/A	---
3.4.33		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	
	L M S	a) Pole E fails open in the reset(or latch) position.	a) There is a loss of the data input (subframe 1) to the Data Rcdr. This results in a loss of recorded subframe 1.	a) None	a) When the ground dumps the Data Rcdr, data is not received.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus (or Bus A) as the PCM Bus.	b) IIIb	
	L M S	a) Pole D fails open in the reset (or latch) position.	a) There is a loss of the TR clock input to the Tape Rcdrs. This results in a lost of recorded subframe 1,2,3 &4 data. M-509/T-013 Experiment data on the Exp 1 Rcdr is not affected.	a) None	a) When the ground dumps the Rcdr(s), there is a loss of recorded data for subframes 1,2,3 & 4.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	
	L M S	a) Pole C fails open in the reset (or latch) position.	a) There is a loss of the R/T TM return from the Xmtr to the Pgmr. This results in a loss of R/T TM.	a) None	a) Ground does not receive R/T TM data. Only the Xmtr's carrier wave is received.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275 DCS Command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #4" (K3-306) (52-79703-61)		a) Pole B fails open in the reset (or latch) position.	a) There is a loss of the R/T TM output from the Pgmr to the Xmtr. This results in a loss of R/T TM data.	a) None	a) Ground does not receive R/T TM data. Only the Xmtr's carrier wave is received.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	
		a) Pole A fails open in the reset (or latch) position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
		a) Reset coil (or latch coil) fails open.	a) When the ground gives the S275 (or S274) DCS command, there is a loss of the following signals: o Subframe 2 data (+) input to the Exp 1 Rcdr. o Subframe 1 data (+) input to the Data Rcdr. o TR Clock input to the tape Rcdrs. o R/T TM return from the Xmtr to the Pgmr. o R/T TM output from the Pgmr to the Xmtr.	a) None	a) Ground observes a loss of R/T TM data and recorded subframes 1,2,3, & 4. Recorded M-509/T-013 Experiment data, recorded Voice and Exp Voice are not affected.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground can perform switching to circumvent the problem.	b) None	b) Ground uses the S274 (or S275) DCS command to switch to Bus B (or Bus A) as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (On Panel 204) (52-79706-59) 3.4.34	L M S	a) Contact set (30, 31, or 30, 33 or 30, 34 or 70, 71 or 70, 72 or 40, 41 or 60, 61) fails open.	a) None. These contact sets are not functional.	a) None	a) None	a) N/A	- - -
or		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	
Switch, Rotary, "Tape Recorders 2" (On Panel 204) (52-79706-59) 3.4.35	M	a) Contact set (30, 32) fails open, switch in "DATA-VOICE" position.	a) (1) When the crew or ground gives a command to turn ON the Data Rcdr, power is not supplied to the Data Rcdr.	a) When the "DATA" switch or a Voice Record Switch is switched to the "RECORD" position, their respective "RECORD" indicator lights do not come ON.	a) (1) When the ground attempts to record Data, R/T TM indicates there is no tape motion and that record command was correctly received and decoded by the DCS. (2) When ground dumps the Data Rcdr, Data and Voice are not received. Only the carrier wave is received from the Xmtrs. R/T TM indicates no tape motion and that the dump command was correctly received and decoded by the DCS.	a) N/A	- - -
or Switch, Rotary, "Tape Recorders 3" (On Panel 204) (52-79706-59) 3.4.36 (Any one of three)							
These Switches are Used for Manual Control of the Rcdrs' data assignments.		b) Insulating film on contacts due to contamination	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "Lighting Status" switch on Panel 207. "RECORD" lights on Panel 204 test good. (3) Crew informs the ground of the anomaly.	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (On Panel 204) (52-79706-59) Or Switch, Rotary, "Tape Recorders 2" (ON Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 3" (On Panel 204) (52-79706-59) (Continued)	M	a) Contact set (50, 52) fails open with switch in the "DATA-VOICE" position.	a) When the crew and ground remove all commands which require that the Data Rcdr be powered-up, the Power Relays for the Rcdr do not reset. Power is applied to the Data Rcdr whenever the PCM Bus is powered-up.	a) (1) When the crew powers down the Data Rcdr, sound emitted from the Rcdr indicate it is still running. The Data and/or Voice "RECORD" lights extinguish as expected. (2) If the end-of-tape is reached, the Data Rcdr "STOP" light comes ON.	a) (1) After ground powers down the Rcdr, R/T TM indicates it has-tape motion and that the commands were correctly received and decoded by the DCS.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
	M	a) Contact set (80, 82) fails open when switch is switched to the "DATA-VOICE" position.	a) If all commands for Rcdr usage are removed prior to switching the switch from the "EXP 1-VOICE" position to the "DATA-VOICE" position, there is no effect. This contact set is used for resetting the Rcdr's Exp Rcdr Bus Power Relays if they are located.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Contact set (40, 42) fails open with switch in the "DATA-VOICE" position.	a) There is a loss of power from the Tape Motion Monitor output of the Data Rcdr to the circuit for latching the Data Rcdr Motion Monitor Relay K3-283.	a) When the crew switches the "DATA" or a Voice Record switch to the "RECORD" position, their respective "RECORD" indicator lights do not come ON.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING" STATUS" switch on Panel 207 to test "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND b) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (On Panel 204) (52-79706-59)	M	a) Contact set (60, 62) fails open with switch in the "DATA-VOICE" position.	a) There is a loss of the Data Rcdr Fast Forward (FF) command.	a) None	a) When ground gives the Data Rcdr FF command and then starts dumping the Rcdr, ground observes Rcdr did not go into FF mode. R/T TM indicates there was tape motion and that the FF command was correctly received by the DCS.	a) N/A	- - -
or							
Switch, Rotary, "Tape Recorders 2" (On Panel 204) (52-79706-59)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
or							
Switch, Rotary, "Tape Recorders 3" (On Panel 204) (52-79706-59) (Continued)	M	a) Contact set (10, 12) fails open when the switch is switched to the "DATA-VOICE" position.	a) The Recorder Manual Control Relays #2 and #3, controlled by this switch, do not cycle to the latch position.	a) None	a) (1) When the Data Rcdr is dumped, neither Data (sub-frame 1) nor Voice is received by the ground. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS. (2) When Data Rcdr and Exp 1 Rcdr are dumped, meaningless data is received from the Exp 1 Xmtr. Data is not received from the Data Rcdr. Also, Voice is garbled since Channel "B" of both Rcdrs is dumping on the same Xmtr.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (On Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 2" (One Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 3" (On Panel 204) (52-79706-59) (Continued)	M	a) Contact set (20, 22) fails open when switch is switched to the "DATA-VOICE" position.	a) The Recorder Manual Control Relay #5, controlled by this switch, does not cycle to the reset position.	a) None	a) (1) When the related "TAPE RECORDERS" switch is switched to the "DATA-VOICE" position: o When ground dumps the Data Rcdr, Data and Voice are not received. Only the carrier wave is received from the Xmtrs. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS. o When the Data and Exp 2 Rcdrs are dumped, Data or Data and Voice are not received from designated Xmtrs. Only the carrier wave is received from the Xmtrs. Meaningless data is received from the Exp 2 Xmtr. If R/T TM in ON, indication is that both Rcdrs have tape motion.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two tape Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
	M	a) Contact set (40, 43) fails open with the switch in the "EXP 1 - VOICE" position.	a) There is a loss of power from the Tape Motion Monitor output of the Exp 1 Rcdr to the circuit for latching the Exp 1 Recorder Motion Monitor Relay, K3-285.	a) When the crew switches on "Exp 1" switch to the "RECORD" position, the Exp 1 "RECORD" light does not come ON.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207 to test the "RECORD" lights on Panel 204.	b) (1) Ground confirms that Exp 1 Rcdr has tape motion. (2) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (3) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (On Panel 204) (59-79706-59) or Switch, Rotary, "Tape Recorders 2" (On Panel 204) (5279706-59) or Switch, Rotary, "Tape Recorders 3" (On Panel 204) (52-79706-59)	M	a) Contact set (70, 73) fails open with switch in the "EXP 1 - VOICE" position.	a) When the crew or ground gives a command to turn ON the Exp 1 Rcdr, power is not supplied to the Rcdr.	a) When an "EXP 1" switch is switched to the "RECORD" position, the Exp 1 "RECORD" lights do not come ON.	a) (1) When the ground dumps the Exp 1 Rcdr, data and Exp Voice are not received. Only the carrier wave is received from the Xmtrs. R/T TM indicates no tape motion and that the dump commands have been correctly received and decoded.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses the "LIGHTING STATUS" switch to check the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
(Continued)	M	a) Contact set (80, 83) fails open with the switch in the "EXP 1 - VOICE" position.	a) When the crew and ground remove all commands which require that the Exp 1 Rcdr be powered-up, the Power Relays for the Rcdr do not reset. Power is applied to the Exp 1 Rcdr whenever the Exp Rcdr Bus is powered-up.	a) (1) When the crew powers down the Exp 1 Rcdr, sounds emitted from the Rcdr indicate it is still running. (2) If the end-of-tape is reached, the Exp 1 Rcdr "STOP" light comes ON. (3) The Exp 1 "RECORD" lights extinguish as expected.	a) (1) After ground powers down the Rcdr, R/T TM indicates it has tape motion and that the commands were correctly received and decoded by the DCS.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (On Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 2" (On Panel 204) (52-79706-59)	M	a) Contact set (20, 23) fails open with switch in "EXP 1 - VOICE" position.	a) The Recorder Manual Control Relay #5, controlled by this switch, does not cycle to the reset position.	a) None	a) (1) When the related "TAPE RECORDERS" switch is switched to the "EXP 1-VOICE" position: o Neither data nor voice is received when the Exp 1 Rcdr is dumped. Only the carrier wave of the Xmtrs is received. R/T TM indicates there is tape motion and that the dump commands have been received and decoded by the DCS.	a) N/A	- - -
or Switch, Rotary, "Tape Recorders 3" (On Panel 204) (52-79706-59) (Continued)		b) Insulatin film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
	M	a) Contact set (50, 53) fails open when the switch is switched to the "EXP 1 - VOICE" position.	a) If all commands for Rcdr usage are removed prior to switching the switch from the "DATA-VOICE" position to the "EXP 1-VOICE" position, there is no effect. This contact set is used for resetting the Rcdr's PCM Bus Power Relays if they are latched.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (On Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 2" (On Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 3" (On Panel 204) (52-79706-59) (Continued)	M	a) Contact set (10, 13) fails open when the switch is switched to the "EXP 1 - VOICE" position.	a) The Recorder Manual Control Relays #2 and #3, controlled by this switch, do not cycle to the reset position.	a) None	a) (1) With the related "TAPE RECORDERS" switch in the "EXP 1-VOICE" position: o When ground attempts to dump the Exp 1 Rcdr, Exp 1 data and Exp Voice are not received by the ground. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS. o When the ground dumps the Data Rcdr and Exp 1 Rcdr, meaningless Data is received from the Data Xmtr since both Rcdrs are dumping channel "A" to the same Xmtr. There is a loss of Exp Voice and Exp 1 data.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
	M	a) Contact set (60, 63) fails open with switch in "EXP 1-VOICE" position.	a) There is a loss of the Fast Forward (FF) command to the Exp 1 Rcdr.	a) None	a) When ground dumps Exp 1 Rcdr after removal of Exp 1 Rcdr FF command, ground observes Rcdr did not go into FF mode. R/T TM indicates there was tape motion and that the FF command was correctly received and decoded by the DCS.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

* COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (On Panel 204) (52-79706-59)	M	a) Contact set (50, 54) fails open when switch is switched to the "EXP 2" position.	a) If all commands for Rcdr usage are removed prior to switching the switch to the "EXP 2" position, there is no effect. This contact set is used for resetting the Rcdr's PCM Bus Power Relays if they are latched.	a) None	a) None	a) N/A	- - -
or Switch, Rotary, "Tape Recorders 2" (On Panel 204) (52-79706-59)		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
or Switch, Rotary, "Tape Recorders 3" (On Panel 204) (5279706-59) (Continued)	M	a) Contact set (70, 74) fails open when switch is in the "EXP 2" position.	a) When the crew or ground gives a command to turn ON the Exp 2 Rcdr, power is not supplied to the Rcdr.	a) When an "EXP 2" switch is switched to the "RECORD" position, the Exp 2 "RECORD" lights do not come ON.	a) (1) When the ground attempts to record Data 2 (subframe 4), R/T TM indicates there is no tape motion but that the Exp Rcdr Bus is powered-up. (2) When ground dumps the Exp 2 Rcdr, data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates no tape motion, that the Exp Rcdr Bus is powered-up and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause anomaly. (2) Crew uses the "LIGHTING STATUS" switch on Panel 207 to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdr. (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (On Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 2" (On Panel 204) (52-79706-59)	M	a) Contact set (10, 14) fails open when switch is switched to the "EXP 2" position.	a) The Recorder Manual Control Relays #2 and #3, controlled by this switch, do not cycle to the reset position.	a) None	a) (1) With the related "TAPE RECORDERS" switch in the "EXP 2" position: o When the Exp 2 Rcdr is dumped, data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdr. (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
(Continued)	M	a) Contact set (40, 44) fails open with switch in the "EXP 2" position.	a) There is a loss of power from the Tape Motion Monitor output of the Exp 2 Rcdr to the circuit for latching the Exp 2 Rcdr Motion Monitor Relay K3-287.	a) When the crew switches an "Exp 2" switch to the "RECORD" position, the Exp 2 "RECORD" light does not come ON.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew uses "LIGHTING STATUS" switch on Panel 207 to test the "RECORD" lights on Panel 204. (3) Crew informs the ground of the anomaly.	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdr. (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (on Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 2" (on Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 3" (on Panel 204) (52-79706-59)	M	a) Contact set (20, 24) fails open when switch is switched to the "EXP 2" position.	a) The Recorder Manual Control Relay # 5, controlled by this switch, does not cycle to the reset position.	a) None	a) (1) When the related "TAPE RECORDERS" switch is switched to the "EXP 2" position: o When Exp 2 Rcdr is dumped, data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the dump command has been correctly received and decoded by the DCS. o When Data and Exp 2 Rcdrs are dumped, meaningless Data and garble Voice are received from the Exp 2 data Xmtr.	a) N/A	---
(Continued)		b) Insulating film on contacts due to contamination.	b) None, Ground or crew can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdr. (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
	M	a) Contact set (60, 64) fails open with switch in the "EXP 2" position.	a) There is a loss of the Fast Forward (FF) command to the Exp 2 Rcdr.	a) None	a) When ground dumps the Exp 2 Rcdr after removal of the FF command, ground observes Rcdr did not go into FF mode. R/T TM indicates there was tape motion and that the FF command was correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination .	b) None, ground or crew can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdr. (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Rotary, "Tape Recorders 1" (on Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 2" (on Panel 204) (52-79706-59) or Switch, Rotary, "Tape Recorders 3" (on Panel 204) (52-79706-59)	M	a) Contact set (80, 84) fails open when the switch is in the "EXP 2" position.	a) When the crew and ground remove all commands which require that the Exp 2 Rcdr be powered-up, the Power Relays for the Rcdr do not reset. Power is applied to the Exp 2 Rcdr whenever the Exp Rcdr Bus is powered-up.	a) (1) When the crew powers down the Exp 2 Rcdr, sounds emitted from the Rcdr indicate it is still running. The Exp 2 "Record" lights extinguish as expected. (2) If the end-of-tape is reached, the Exp 2 Rcdr "Stop" light comes ON.	a) (1) After ground powers down the Rcdr, R/T TM indicates it has tape motion and that the commands were correctly received and decoded by the DCS.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) (1) Ground requests that the crew switch to one of the two other Rcdrs as the Exp 2 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
(Continued)	M	a) Contact set (50, 51, or 80, 81) fails open when switch is switched to the "OFF" position.	a) If all commands for Rcdr usage are removed prior to switching the switch to the "OFF" position, there is no effect. These contact sets are used for resetting the Rcdr's PCM Bus and Exp Rcdr Bus Power Relays respectively if they are latched.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

* COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Man Control Relay #1" (K3-163) (52-79715-13) 3.4.37 or Relay, Slow Release, "Recorder #2 Man Control Relay #1" (K3-195) (52-79715-13) 3.4.42 or Relay, Slow Release, "Recorder #3 Man Control Relay #1" (K3-176) (52-79715-13) 3.4.47 (Assumed failure applicable only if the switch which controls the relay is set for the data assignment which is affected by the failure.) Relays are controlled by their respective "TAPE RECORDERS" switches on Panel 204.	M	a) (1) Pole A fails open when the coil is energized, or (2) The coil fails open. (Continued on next page)	a) (1) When the related "TAPE RECORDERS" switch is switched to the "DATA-VOICE" position, there is the following effect: o Data Rcdr PB command is to open relay contacts. o Data (subframe 1) input is to open relay contacts o Exp 1 PB to Exp 1 Rcdr and Data Rcdr. o Exp 1 data Clock and M-509/T-013 Clock go to Exp 1 Rcdr and Data Rcdr. o Exp 1 data (subframe 2) and M-509/T-013 data go to Exp 1 Rcdr and Data Rcdr. o Channel "A" (data) output goes to Exp 1 output circuit. o Channel "B" (Voice) goes to Exp Voice output circuit. (2) When the crew switches the related "TAPE RECORDERS" switch on Panel 204 to the "EXP 2" position, there is the following effect: o Exp 2 input signal for channel "A" is to open contacts. o Exp 1 data Clock and M-509/T-013 Clock go to Exp 1 Rcdr and Exp 2 Rcdr. o Channel "A" and Channel "B" outputs are to open relay contacts.	a) None	a) (1) With the related "TAPE RECORDERS" switch in the "DATA-VOICE" position: o When the Data Rcdr is dumped, neither Data (subframe 1) nor Voice is received by the ground. Only the carrier wave is received from the Xmtr(s) R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS. o When Data Rcdr and Exp 1 Rcdr are dumped, meaningless data is received from the Exp 1 Xmtr. Data is not received from the Data Rcdr. Also, Voice is garbled since Channel "B" of both Rcdrs is dumping on the same Xmtr. (2) With the related "TAPE RECORDERS" switch in the "EXP 2" position: o When the Exp 2 Rcdr is dumped, data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Man Control Relay #1" (K3-163) (52-79715-13) or Relay, Slow Release, "Recorder #2 Man Control Relay #1" (K3-195) (52-79715-13) or Relay, Slow Release, "Recorder #3 Man Control Relay #1" (K3-176) (52-79715-13) (Continued)	M	b) (1) Insulating film on contacts due to contamination (2) Defective wire or terminal due to mechanical or thermal stress a) (1) Pole B fails open when the coil is energized, or (2) The coil fails open. (Continued on next page)	b) None. Crew or ground can perform switching to circumvent the problem. a) (1) When the crew switches the related "TAPE RECORDERS" switch to the "EXP 1-VOICE" position, there is the following effect: o Loss of the Exp 1 Rcdr PB command. o Loss of Exp 1 data input. o Data Rcdr PB command also goes to Exp 1 Rcdr. o Loss of Exp 1 and M-509/T-013 Clock input signal. Data/Exp 2 Clock also goes to Exp 1 Rcdr. o Data (subframe 1) signal also goes to Data Rcdr. o Channel "A" output goes to the Data output circuit. o Channel "B" (Exp Voice) output circuit goes to the Voice circuit. (2) When the crew switches the related "TAPE RECORDERS" switch to the "OFF" position the following signals go to the Exp 2 Rcdr as well as the Rcdr which has been switched "OFF": o Exp 2 data input o Data/Exp 2 Clock o Exp 2 Rcdr PB command	b) None a) None	b) (1) Ground requests that the crew switch the affected Rcdr's switch to the "EXP 1-VOICE" position, or (2) Ground requests that the crew return control of the Rcdrs to the DCS. a) (1) With the related "TAPE RECORDERS" switch in the "EXP 1-VOICE" position: o When ground attempts to dump the Exp 1 Rcdr, Exp 1 data and Exp Voice are not received by the ground. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS. o When the ground dumps the Data Rcdr and Exp 1 Rcdr, meaningless Data is received from the Data Xmtr since both Rcdrs are dumping Channel "A" to the same Xmtr. There is a loss of Exp Voice and Exp 1 Data. (2) No method of detecting the "OFF" position related failure.	b) IIIb a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Man Control Relay #1" (K3-163) (52-79715-13) or Relay, Slow Release, "Recorder #2 Man Control Relay #1" (K3-195) (52-79715-13) or Relay, Slow Release, "Recorder #3 Man Control Relay #1" (K3-176) (52-79715-13) (Continued)		a) (1) Pole B fails open when the coil is energized, or (2) The coil fails open. (Continued from previous page) b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch the affected Rcdr's switch to the "DATA-VOICE" or "EXP 2" position, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder #1 Man Control Relay #2" (K3-164) (52-79703-61) 3.4.38	M	a) Pole F fails open in the latch position.	a) There is a loss of the Exp 2 Rcdr data output to the TM Xmtr.	a) None	a) When the ground dumps the Exp 2 Rcdr, data is not received. Only the Xmtr carrier wave is received. R/T TM indicates the Rcdr has tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	---
or							
Relay, Latching, "Recorder #2 Man Control Relay #2" (K3-196) (52-79703-61) 3.4.43	M	b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdr	b) IIIb	
		a) Pole F or Pole D fails open in the reset position.	a) None. These poles are not functional in the reset position.	a) None	(2) Ground requests that the crew return control of the Rcdrs to the DCS.	a) N/A	---
or					a) None		
Relay, Latching, "Recorder #3 Man Control Relay #2" (K3-181) (52-79703-61) 3.4.48 (Assumed failure applicable only if the switch which controls the relay is set for the data assignment which is affected by the failure.) These relays are controlled by the "TAPE RECORDERS 1/2/3" switches on Panel 204.		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole F fails open in the reset position.	a) There is a loss of the Exp 1 Rcdr data output to the TM Xmtr. Exp Voice is not affected.	a) None	a) When the ground dumps the Exp 2 Rcdr, data is not received. Only the Xmtr's carrier wave is received. Exp Voice reception is not affected.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder #1 Man Control Relay #2" (K3-164) (52-79703-61)	M	a) Pole C fails open in the reset position.	a) Loss of the data input (sub-frame 2 or M-509/T-013) to the Exp 1 Rcdr. Exp Voice input is not affected.	a) None	a) When the ground dumps the Exp 1 Rcdr, data is not received. Only the Xmtr's carrier wave is received. Exp Voice reception is not affected.	a) N/A	---
or Relay, Latching, "Recorder #2 Man Control Relay #2" (K3-196) (52-79703-61)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
or Relay, Latching, "Recorder #3 Man Control Relay #2" (K3-181) (52-79703-61) (Continued)	M	a) Pole E fails open in the latch position.	a) Loss of the data output from the Data Rcdr to the TM Xmtr. The Voice output is not affected.	a) None	a) When the ground dumps the Data Rcdr, data is not received. Only the Xmtr's carrier wave is received. Recorded Voice is not affected.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy is provided by Pole B of Relay K3-169 or K3-219 or K3-185.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #2" (K3-164) (52-79703-61)	M	a) Pole D fails open in the latch position.	a) Loss of the data input (subframe 3 or subframe 4) to the Exp 2 Rcdr.	a) None	a) When the ground dumps the Exp 2 Rcdr, data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates that there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	---
or							
Relay, Latching, "Recorder #2 Man Control Relay #2" (K3-196) (52-79703-61)		b) Insulating film on contacts due to contamination	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
or	M	a) Pole C fails open in the latch position.	a) There is a loss of the data input (subframe 1) to the Data Rcdr. Recorded Voice is not affected.	a) None	a) When the ground dumps the Data Rcdr, data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates that there is not tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	---
Relay, Latching, "Recorder #3 Man Control Relay #2" (K3-181) (52-79703-61) (Continued)		b) Insulating film on contacts due to contamination	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder #1 Man Control Relay #2" (K3-164) (52-79703-61) or Relay, Latching, "Recorder #2 Man Control Relay #2" (K3-196) (52-79703-61) or Relay, Latching, "Recorder #3 Man Control Relay #2" (K3-181) (52-79703-61) (Continued)	M	a) Latch coil fails open.	a) (1) When the crew switches the related "TAPE RECORDERS" switch on Panel 204 to the "DATA-VOICE" position, there is the following effect: o Data (subframe 1) input is to open relay contacts. o Exp 1 Rcdr data input is to the Data Rcdr as well as the Exp 1 Rcdr. o Data Rcdr data output is to the Exp 1 output circuit. (2) When the crew switches the related "TAPE RECORDERS" switch on Panel 204 to the "EXP 2" position, there is the following effect: o Exp 2 data input (subframe 3 or subframe 4) is to open relay contacts. o There is no input to channel "A" of the Exp 2 Rcdr. o Exp 2 Rcdr channel "A" output is to open relay contacts.	a) None	a) (1) With the related "TAPE RECORDERS" switch in the "DATA-VOICE" position: o When the Data Rcdr is dumped, Data (subframe 1) is not received. Recorded Voice reception is not affected. o When the Data Rcdr and the Exp 1 Rcdr are both dumped, meaningless data is received since both Rcdrs are dumping to the same Xmtr. (2) With the related "TAPE RECORDERS" switch in the "EXP 2" position: o When the Exp 2 Rcdr is dumped, data is not received from the Rcdr. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch the affected Rcdr's switch to the "EXP 1 - VOICE" position, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder #1 Man Control Relay #2" (K3-164) (52-79703-61) or Relay, Latching, "Recorder #2 Man Control Relay #2" (K3-196) (52-79703-61) or Relay, Latching, "Recorder #3 Man Control Relay #2" (K3-181) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) (1) When the crew switches the related "TAPE RECORDERS" switch on Panel 204 to the "EXP 1 - VOICE" position, there is the following effect: o The Exp 1 (subframe 2 or M-509/T-013) input is to open relay contacts. o The Data (subframe 1) input is to the Exp 1 Rcdr as well as the Data Rcdr. o The Exp 1 Rcdr data output is to the Data output circuit. (2) When the crew switches the related "TAPE RECORDERS" switch on Panel 204 to the "OFF" position, there is the following effect: o The Exp 2 Rcdr data (subframe 3 or subframe 4) input also goes to the "A" channel input of the affected Rcdr.	a) None	a) (1) With the related "TAPE RECORDERS" switch in the "EXP 1 - VOICE" position: o When the ground dumps the Exp 1 Rcdr, data is not received, only the Xmtr's carrier wave is received. Exp Voice reception is not affected. o When the Exp 1 and Data Rcdrs are dumped, meaningless data is received since both Rcdrs are dumping data to the same Xmtr. Exp Voice reception is not affected. Data is not received from the Exp 1 data Xmtr. (2) No method of detecting the "OFF" position related failure.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Ground or crew can perform switching to circumvent to problem.	b) None	b) (1) Ground requests that the crew switch the affected Rcdr's switch to the "DATA-VOICE" or "EXP 2" position, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder #1 Man Control Relay #3" (K3-169) (52-79703-61) 3.4.39	M	a) Pole F fails open in the reset position.	a) There is a loss of the Clock input to the Rcdr manually designated as the Exp 1 Rcdr.	a) None	a) When the ground dumps the Exp 1 Rcdr, meaningless data is received. Exp Voice is not affected.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
or							
Relay, Latching, "Recorder #2 Man Control Relay #3" (K3-219) (52-79703-61) 3.4.44	M	a) Pole E fails open in the latch position.	a) There is a loss of the Playback command to the Rcdr manually designated as the Exp 2 Rcdr.	a) None	a) When the ground attempts to dump the Exp 2 Rcdr, data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the Dump Execute command was correctly received and decoded by the DCS.	a) N/A	- - -
or							
Relay, Latching "Recorder #3 Man Control Relay #3" (K3-185) (52-79703-61) 3.4.49		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdrs, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
(Assumed failure applicable only if the switch which controls the relay is set for the data assignment which is affected by the failure.)	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy is provided on Pole B of Relay K3-164 or K3-196 or K3-181.	a) None	a) None	a) N/A	- - -
These relays are controlled by the "TAPE RECORDERS 1/2/3" switches on Panel 204.		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Recorder #1 Man Control Relay #3" (K3-169) (52-79703-61)	M	a) Pole C fails open in the reset position.	a) There is a loss of the Exp Voice output from the designated Exp 1 Rcdr to the TM Xmtr.	a) None	a) When the ground dumps the Exp 1 Rcdr, Exp Voice is not received. Only the Xmtr's carrier wave is received. Exp 1 data is not affected.	a) N/A	- - -
or Relay, Latching, "Recorder #2 Man Control Relay #3" (K3-219) (52-79703-61)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
or Relay, Latching, "Recorder #3 Man Control Relay #3" (K3-185) (52-79703-61) (Continued)	M	a) Pole D fails open in the reset position.	a) There is a loss of the Playback command to the Rcdr manually designated as the Exp 1 Rcdr.	a) None	a) When the ground attempts to dump the Exp 1 Rcdr, data and Exp Voice are not received. Only the carrier wave is received from the Xmtrs. R/T TM indicates there is tape motion and that the Dump Execute command was correctly received and decoded by the DCS.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #3" (K3-169) (52-79703-61)	M	a) Pole F fails open in the latch position.	a) There is a loss of Clock input to the Data Rcdr or to the Exp 2 Rcdr, depending upon which function the corresponding switch is set to.	a) None	a) When ground dumps the related Rcdr, meaningless data is received.	a) N/A	- - -
or Relay, Latching, "Recorder #2 Man Control Relay #3" (K3-219) (52-79703-61)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other Rcdrs as the Data or Exp 1 Rcdr, depending upon which function experienced the problem, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
or Relay, Latching, "Recorder #3 Man Control Relay #3" (K3-185) (52-79703-61)	M	a) Pole E fails open in the reset position.	a) None. This pole is not functional in the latch position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
(Continued)	M	a) Pole D fails open in the latch position.	a) There is a loss of the Playback command to the manually designated Data Rcdr.	a) None	a) When the ground attempts to dump the Data Rcdr, neither Data nor Voice is received. Only the carrier wave is received from the Xmtrs. R/T TM indicates there is tape motion and that the Dump Execute command was correctly received and decoded by the DCS.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdr to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #3" (K3-169) (52-79703-61)	L M S	a) Pole A fails open in the reset (or latch) position.	a) None. GSE use only.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
or							
Relay, Latching, "Recorder #2 Man Control Relay #3" (K3-219) (52-79703-61)	M	a) Pole C fails open in the latch position.	a) There is a loss of the Voice output from the Data Rcdr to the Xmtr. The data output from the Data Rcdr is not affected.	a) None	a) Ground does not receive Voice when the Data Rcdr is dumped. Only the Xmtr's carrier wave is received.	a) N/A	- - -
or		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Data Rcdr, or (2) Ground requests that the crew return control of the Rcdr to the DCS.	b) IIIb	
Relay, Latching, "Recorder #3 Man Control Relay #3" (K3-185) (52-79703-61)							
(Continued)							

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #3" (K3-169) (52-79703-61) or Relay, Latching, "Recorder #2 Man Control Relay #3" (K3-219) (52-79703-61) or Relay, Latching, "Recorder #3 Man Control Relay #3" (K3-185) (52-79703-61) (Continued)	M	a) Latch coil fails open.	a) (1) When the crew switches the related "TAPE RECORDERS" switch on Panel 204 to the "DATA-VOICE" position, there is the following effect: o The Exp 1 PB command is to the Data Rcdr as well as the Exp 1 Rcdr. o The "B" output (Voice) of the Data Rcdr is to the Exp Voice Xmtr circuit. o The Exp 1 Clock is to the Data Rcdr as well as Exp 1 Rcdr - no problem unless M-509/T-013 is being recorded, then M-509/T-013 clock is to Data Rcdr and Exp 1 Rcdr. o Data Rcdr PB command is to open relay contacts. (2) When the crew switches the related "TAPE RECORDERS" switch on Panel 204 to the "EXP 2" position, there is the following effect: o Exp 2 Rcdr PB command is to open relay contact. o The Exp 1 Clock is to the Exp 2 Rcdr as well as the Exp 1 Rcdr - no problem unless M-509/T-013 is being recorded, then M-509/T-013 Clock is to Exp 1 and Exp 2 Rcdrs.	a) None	a) (1) With the related "TAPE RECORDERS" switch in the "DATA-VOICE" position: o Data or Data and Voice are not received when the ground attempts to dump the Data Rcdr. Only the carrier wave is received from the Xmtr(s) R/T TM indicates there is tape motion and that the Dump Execute commands have been correctly received and decoded by the DCS. o When ground dumps the Exp 1 Rcdr, they may be able to determine that the voice received is from the Data Rcdr. Also, R/T TM will indicate that the Data Rcdr has tape motion. (2) With the related "TAPE RECORDERS: switch in the "Exp 2" position: o Data is not received when ground attempts to dump the Exp 2 Rcdr. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the Dump Execute command has been correctly received and decoded by the DCS.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch the affected Rcdr's switch to the "EXP 1 - VOICE" position, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #3" (K3-169) (52-79703-61) or Relay, Latching, "Recorder #2 Man Control Relay #3" (K3-219) (52-79703-61) or Relay, Latching, "Recorder #3 Man Control Relay #3" (K3-185) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) (1) When the crew switches the related "TAPE RECORDERS" switch on Panel 204 to the "EXP 1 - VOICE" Position, there is the following effect: o Data Rcdr PB command is to the Exp 1 Rcdr. o Data/Exp 2 Clock is to the Exp 1 Rcdr as well as the intended Rcdrs - no problem unless M-509/T-013 is being recorded, then the M-509/T-013 Clock is to open relay contacts. o Exp 1 Rcdr PB command is to open relay contacts. o Exp Voice output to Voice circuit. (2) When the crew switches the related "TAPE RECORDERS" switch on Panel 204 to the "OFF" position, there is the following effect: o Exp 2 Rcdr data input also goes to Rcdr which has been switched "OFF". o Data/Exp 2 Clock input also goes to Rcdr which has been switched "OFF". o The Exp 2 Rcdr PB command also goes to the Rcdr which has been switched "OFF".	a) None	a) (1) With the related "TAPE RECORDERS" switch in the "Exp 1 - Voice" position: o When the ground attempts to dump the Exp 1 Rcdr, data and Exp Voice are not received. Only the carrier wave is received from the Xmtrs. R/T TM indicates there is tape motion and that the Dump Execute command has been correctly received and decoded by the DCS. (2) No method of detecting the "OFF" position releted failure.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch the affected Rcdr's switch to the "DATA-VOICE" or "EXP 2" position, or (2) Ground requests that the crew return control of the Rcdr's to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Man Control Relay #4" (K3-170) (52-79715-13) 3.4.40 or Relay, Slow Release, "Recorder #2 Man Control Relay #4" (K3-281) (52-79715-13) 3.4.45 or Relay, Slow Release, "Recorder #3 Man Control Relay #4" (K3-186) (52-79715-13) 3.4.50 or (Assumed failure applicable only if the switch which controls the relay is set for the data assignment which is affected by the failure.) Relays are controlled by their respective "TAPE RECORDERS" switches on Panel 204.	M	a) (1) Pole A fails open when the coil is energized, or, (2) The coil fails open. (Continued on next page)	a) (1) When the related "TAPE RECORDERS" switch is switched to the "DATA-VOICE" poition, there is the following effect: o Loss of Data (subframe 1) and Data PB commands to the Data Rcdr. o Exp 2 (subframes 3 or 4) to Data Rcdr channel "A" input as well as to the Exp 2 Rcdr. o Exp 2 PB command to Data Rcdr and Exp 2 Rcdr. o Channel "A" (data) output to the Exp 2 data output circuit. (2) When the related "TAPE RECORDERS" switch is switched to the "EXP 1-VOICE" position, there is the following effect: o Loss of channel "A" input and PB command input. o Loss of channel "A" and channel "B" outputs due to open relay contacts.	a) None	a) (1) When the related "TAPE RECORDERS" switch is switched to the "DATA-VOICE" position: o When ground dumps the Data Rcdr, Data and Voice are not received. Only the carrier wave is received from the Xmtrs. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS. o When the Data and Exp 2 Rcdrs are dumped, Data or Data and Voice are not received from designated Xmtrs. Only the carrier wave is received from the Xmtr(s). Meaningless data is received from the Exp 2 Xmtr. If R/T TM is ON, indication is that both Rcdrs have tape motion. (2) When the related "TAPE RECORDERS" switch is switched to the "EXP 1-VOICE" position: o Neither data nor voice is received when the Exp 1 Rcdr is dumped. Only the carrier wave of the Xmtrs is received. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Man Control Relay #4" (K3-170) (52-79715-13) Or Relay, Slow Release, "Recorder #2 Man Control Relay #4" (K3-281) (52-79715-13) Or Relay, Slow Release, "Recorder #3 Man Control Relay #4" (K3-186) (52-79715-13) (Continued)		b) (1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch the affected Rcdr's "TAPE RECORDERS" switch to the "EXP 2" position, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder #1 Man Control Relay #4: (K3-170) (52-79715-13) or Relay, Slow Release, "Recorder #2 Man Control Relay #4" (K3-281) (52-79715-13) or Relay, Slow Release, "Recorder #3 Man Control Relay #4" (K3-186) (52-79715-13) (Continued)	M	a) (1) Pole B fails open when the coil is energized, or (2) Coil fails open.	a) (1) When the related "TAPE RECORDERS" switch is switched to the "EXP 2" position, there is the following effect: o Loss of data (subframes 3 or 4) and Exp 2 Rcdr PB command inputs. o Data (subframe 1) input is to Data and Exp 2 Rcdrs. o Data PB command is to Data and Exp 2 Rcdrs. o Channel "A" & "B" outputs are to Data & Voice output circuits respectively. (2) When the crew switches the related "TAPE RECORDERS" switch to the "OFF" position there is the following effect: o The Exp 1 data input goes to the Exp 1 Rcdr and to the affected Rcdr. o The Exp 1 PB command goes to the Exp 1 Rcdr and to the affected Rcdr.	a) None	a) (1) When the related "Tape Recorders" switch is switched to the "Exp 2" position: o When Exp 2 Rcdr is dumped data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the dump command has been correctly received and decoded by the DCS. o When Data and Exp 2 Rcdrs are dumped, meaningless Data and Garbled Voice are received. Only the carrier wave is received from the Exp 2 from the Exp 2 data Xmtr. (2) No method of detecting the "OFF" position related failure.	a) R/A	---
		b) (1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) None, Ground or crew can perform switching to circumvent the problem.	b) None	b) (1) Ground requests that the crew switch the affected Rcdr's switch to the "DATA-VOICE" or "EXP 1-EXP VOICE" position, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #5 (K3-175) (52-79703-61) 3.4.41 or Relay, Latching, "Recorder #2 Man Control Relay #5 (K3-282) (52-79703-61) 3.4.46 or Relay, Latching, "Recorder #3 Man Control Relay #5 (K3-191) (52-79703-61) 3.4.51 (Assumed failure applicable only if the switch which controls the relay is set for the data assignment which is affected by the failure.) Relays are controlled by their respective "TAPE RECORDERS" switches on Panel 204.	M	a) Pole F fails open in the reset position.	a) (1) If the related "TAPE RECORDERS" switch is in the "EXP 2" position, there is a loss of the PB command to the Exp 2 Rcdr.	a) None.	a) When the ground attempts to dump the Exp 2 Rcdr, data (subframe 3 or subframe 4) is not received. Only the carrier wave is received from the Xmtr. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) (1) Ground requests that the crew switch the affected Rcdr to be the Data or Exp 1 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) There is a loss of the channel "B" (voice) output from the affected Rcdr.	a) None.	a) When the ground attempts to dump the affected Rcdr, voice is not received from the Rcdr. The voice Xmtr's carrier wave is received along with channel "A" (data) from the Rcdr. R/T TM indicates the dump commands were correctly received and decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) (1) Ground requests that the crew switch the affected Rcdr to be the Exp 2 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #5" (K3-175) (52-79703-61)	M	a) Pole D fails open in the reset position.	a) (1) There is a loss of the channel "A" (data) output from the Exp 2 Rcdr to the TM Xmtr.	a) None.	a) When the ground dumps the Exp 2 Rcdr, data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	----
or							
Relay, Latching, "Recorder #2 Man Control Relay #5" (K3-282) (52-79703-61)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
or							
Relay, Latching, "Recorder #3 Man Control Relay #5" (K3-191) (52-79703-61)	M	a) Pole C fails open in the reset position.	a) (1) There is a loss of the data input to the Exp 2 Rcdr.	a) None.	a) When the ground dumps the Exp 2 Rcdr, data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	----
(Continued)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) (1) Ground requests that the crew switch to one of the other two Rcdrs as the Exp 2 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) None - This pole is not functional in the reset position.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Mnn Control Relay #5" (K3-175) (52-79703-61) or Relay, Latching, "Recorder #2 Mnn Control Relay #5" (K3-282) (52-79703-61) or Relay, Latching, "Recorder #3 Mnn Control Relay #5" (K3-191) (52-79703-61) (Continued)	M	a) Pole F fails open in the latch position.	a) There is a loss of the Exp 1 or Data PB command (depending upon switch position for the affected Rcdr). Affected Rcdr will not dump data or voice when the PB command is given.	a) None.	a) When the ground dumps the affected Rcdr, neither data nor voice is received. Only the carrier wave is received from the Xmtr(s). R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) (1) Ground requests that the crew switch the affected Rcdr to be the Exp 2 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	
		a) Pole D fails open in the latch position.	a) Depending upon the switch position for the affected Rcdr, there is a loss of the Data Rcdr or Exp 1 Rcdr data output to the Xmtr.	a) None.	a) When the ground dumps the affected Rcdr, data is not received. Only the Xmtr's carrier wave is received. The reception of voice from the Rcdr is not affected.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) (1) Ground requests that the crew switch the affected Rcdr to be the Exp 2 Rcdr, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #5" (K3-175) (52-79703-61)	M	a) Pole C fails open in the latch position.	a) Depending upon the switch position for the affected Rcdr, there is a loss of channel "A" (data) input to the Data Rcdr or the Exp 1 Rcdr.	a) None.	a) When the ground dumps data from the affected Rcdr, the is not received. Only data Xmtr's carrier wave is received. The reception of voice from the Rcdr is not aff[illegible]	a) N/A	----
or							
Relay, Latching, "Recorder #2 Man Control Relay #5" (K3-282) (52-79703-61)		b) Insulating film on contacts due to contamination.	b) None. Crew or ground can perform switching to circumvent the problem.	b) None.	b) (1) [illegible] requests that the [illegible] ch the affected [illegible] e the Exp 2 Rcdr. (2) [illegible] quests that the [illegible] rn control of [illegible] a to the DCS.	b) IIIb	
or							
Relay, Latching, "Recorder #3 Man Control Relay #5" (K3-191) (52-79703-61) (Continued)	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #5" (K3-175) (52-79703-61) or Relay, Latching, "Recorder #2 Man Control Relay #5" (K3-282) (52-79703-61) or Relay, Latching, "Recorder #3 Man Control Relay #5" (K3-191) (52-79703-61) (Continued)	M	a) (1) Latch coil fails open, or (2) Pole B fails open in the reset position. (Continued next page)	a) (1) When the related "TAPE RECORDERS" switch is switched to the "DATA-VOICE" position, there is the following effect: o Loss of Data (subframe 1) and Data PB commands to the Data Rcdr. o Exp 2 (subframes 3 or 4) to Data Rcdr channel "A" input as well as to the Exp 2 Rcdr. o Exp 2 PB command to Data Rcdr and Exp 2 Rcdr. o Channel "A" (data) output to the Exp 2 data output circuit. (2) When the related "TAPE RECORDERS" switch is switched to the "EXP 1 - VOICE" position, there is the following effect: o Loss of channel "A" input and PB command input. o Loss of channel "A" and channel "B" outputs due to open relay contacts.	a) None.	a) (1) When the related "TAPE RECORDERS" switch is switched to the "DATA-VOICE" position: o When ground dumps the Data Rcdr, Data and Voice are not received. Only the carrier wave is received from the Xmtrs. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS. o When the Data and Exp 2 Rcdrs are dumped, Data or Data and Voice are not received from designated Xmtrs. Only the carrier wave is received from the Xmtr(s). Meaningless data is received from the Exp 2 Xmtr. If R/T TM is ON, indication is that both Rcdrs have tape motion. (2) When the related "TAPE RECORDERS" switch is switched to the "EXP 1-VOICE" position: o Neither data nor voice is received when the Exp 1 Rcdr is dumped. Only the carrier wave of the Xmtrs is received. R/T TM indicates there is tape motion and that the dump commands have been correctly received and decoded by the DCS.	a) N/A	----

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #5" (K3-175) (52-79703-61) or Relay, Latching, "Recorder #2 Man Control Relay #5" (K3-282) (52-79703-61) or Relay, Latching, "Recorder #3 Man Control Relay #5" (K3-191) (52-79703-61) (Continued)	M	b) (1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination. a) (1) Reset coil fails open, or (2) Pole B fails open in the latch position.	b) None. Crew or ground can perform switching to circumvent the problem. a) (1) When the related "TAPE RECORDERS" switch is switched to the "EXP 2" position, there is the following effect: o Loss of data (subframes 3 or 4) and Exp 2 Rcdr PB command inputs. o Data (subframe 1) input is to Data and Exp 2 Rcdrs. o Data PB command is to Data and Exp 2 Rcdrs. o Channel "A" & "B" outputs are to Data & Voice output circuits respectively. (2) When the crew switches the related "TAPE RECORDERS" switch to the "OFF" position there is the following effect: o The Exp 1 data input goes to the Exp 1 Rcdr and to the affected Rcdr. o The Exp 1 PB command goes to the Exp 1 Rcdr and to the affected Rcdr.	b) None. a) None.	b) (1) Ground requests that the crew switch the affected Rcdrs "TAPE RECORDERS" switch to the "EXP 2" position, or (2) Ground requests that the crew return control of the Rcdrs to the DCS. a) (1) When the related "TAPE RECORDERS" switch is switched to the "EXP 2" position: o When Exp 2 Rcdr is dumped data is not received. Only the Xmtr's carrier wave is received. R/T TM indicates there is tape motion and that the dump command has been correctly received and decoded by the DCS. o When Data and Exp 2 Rcdrs are dumped, meaningless Data and garbled Voice are received. Only the carrier wave is received from the Exp 2 Data Xmtr. (2) No method of detecting the "OFF" position related failure.	b) I.Ib a) N/A	----

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder #1 Man Control Relay #5" (K3-175) (52-79703-61) or Relay, Latching, "Recorder #2 Man Control Relay #5" (K3-282) (52-79703-61) or Relay, Latching, "Recorder #3 Man Control Relay #5" (K3-191) (52-79703-61) (Continued)		b) (1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) None. Ground or crew can perform switching to circumvent the problem.	b) None.	b) (1) Ground requests tha the crew switch the affected Rcdr's switch to the "DATA-VOICE" or "EXP 1-VOICE" position, or (2) Ground requests that the crew return control of the Rcdrs to the DCS.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relay #1" (K3-373) (52-79703-61) 3.4.52	M	a) Pole F or Pole D fails open in the reset position.	a) None. Not used unless the reset coil of Relay K3-374 fails open.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole F fails open in the latch position.	a) Loss of the Electrocardiogram Channel A (M405), 320 sps input signal to the Interface Box for Subframe 2 (R/T and delayed time).	a) None	a) Ground observes a loss of the Electrocardiogram Channel A (M405) parameter in Subframe 2 (R/T and delayed time).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, other than a loss of recorded M405 data. R/T M405 is still available in the Master Frame format.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position This switches M405 to the Master Frame format.	b) IIIb	
This relay is controlled by the "EKG/ZPN" switch on Panel 204	M	a) Pole E fails open in the reset position.	a) Loss of the Electrocardiogram Channel A (M405), 320 sps input signal to the Interface Box for the Master Frame (R/T TM).	a) None	a) Ground observes a loss of the Electrocardiogram Channel A (M405) parameter in the Master Frame format (R/T TM).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The M405 parameter is still available in the subframe 2 format.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "ENABLE" position this switches the M405 parameter to subframe 2 (R/T & delayed time).	b) IIIb	
	M	a) Pole E or Pole C fails open in the latch position.	a) None - These poles are not functional in the latch position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-374.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relay #1" (K3-373) (52-79703-61) (continued)	M	a) Pole D fails open in the latch position.	a) Loss of the Impedance Pneumograph, Channel A. (M403), 40 sps input signal to the Interface Box for Subframe 2 (R/T and delayed time).	a) None	a) Ground observes a loss of the Impedance Pneumograph, Channel A, (M403) parameter in Subframe 2 (R/T and delayed time).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, other than a loss of recorded M403 data. R/T M403 is still available in the Master Frame Format.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. This switches the M403 para- to the Master Frame (R/T TM).	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) Loss of the Impedance Pneumograph, Channel A (M403), 80 sps input signal to the Interface Box for the Master Frame format (R/T TM).	a) None	a) Ground observes a loss of the Impedance Pneumograph, Channel A, (M403) parameter in the Master Frame format (R/T TM).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. The M403 parameter is still available in the Subframe 2 format.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "ENABLE" position. This switches the M403 parameter to Subframe 2 (R/T and delayed time).	b) IIIb	
	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relay #1" (K3-373) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) Loss of the Impedance Pneumograph, Channel A (M403), 80 sps and the Electrocardiogram, Channel A (M405), 320 sps input signals to the Interface Box for the Master Frame format.	a) None	a) Ground observes a loss of the Impedance Pneumograph, Channel A (M403), and Electrocardiogram, Channel A (M405) parameters in the Master Frame format (R/T TM).	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, other than a loss of M403 and M405 parameters in the Master Frame. They are still available in Subframe 2.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "ENABLE" position. This switches the M403 and M405 parameters to Subframe 2 (R/T and delayed time).	b) IIIb	
	M	a) Latch coil fails open.	a) Loss of the Impedance Pneumograph, Channel A (M403) 40 sps and the Electrocardiogram, Channel A (M405), 320 sps input signals to the Interface Box for the Subframe 2 format.	a) None	a) Loss of the Impedance Pneumograph, Channel A (M403), and Electrocardiogram, Channel A (M405) parameters in the Subframe 2 format (R/T and delayed time).	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None, other than a loss of recorded M403 and M405 parameters. R/T M403 and M405 are still available in the Master Frame format.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. The switches the M403 and M405 parameters to the Master Frame (R/T TM).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, latching "EKG/ZPN Relay #2" (K3-374) (52-79703-61) 3.4.53	M	a) Pole F fails open in the reset position.	a) With the "EKG/ZPN" switch in the "OFF" position, there is a loss of the Vectorcardiogram No. 1 (N301), 320 sps input signal to the Interface Box for Subframe 2 (R/T and delayed time).	a) None	a) Loss of Vectorcardiogram No. 1 (N301) in Subframe 2 (R/T and delayed time).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of Vectorcardiogram No. 1 (N301) R/T and delayed time data.	b) None	b) Ground informs crew of the anomaly.	b) IIIb	
This relay is controlled by the "EKG/ZPN" switch on Panel 204. Switch in "OFF" position, relay is reset. Switch in "ENABLE" position, relay in latch position.	M	a) Pole F fails open in the latch position.	a) With the "EKG/ZPN" switch in the "ENABLE" position, there is a loss of the Electrocardiogram, Channel A, (M405) input signal to the Interface Box for Subframe 2 (R/T and delayed time).	a) None	a) Loss of Electrocardiogram, Channel A (M405) in Subframe 2 (R/T and delayed time).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) The M405 parameter is still available in the Master Frame (R/T TM).	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. This switches the M405 parameter to the Master Frame (R/T TM).	b) IIIb	
	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-373.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only .	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	a) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relay #2" (K3-374) (52-79703-61) (Continued)	M	a) Pole E fails open in the reset positon.	a) (1) With the "EKG/ZPN" switch in the "OFF" position, there is a loss of the Subframe 2 and M-509/T-013 input signal to the Exp 1 Rcdr. (2) R/T Subframe 2 is not affected.	a) None	a) The ground observes a loss of recorded Subframe 2 and M-509/T013 data. R/T Subframe 2 is not affected.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) The Subframe 2 data input to the Exp 1 Rcdr can be restored but with a loss of the following parameters on Subframes 2 and 3: o Subframe 2 - N301 and N304. o Subframe 3 - N302, N303, N307 and N308. Note - N304 has been deleted but is still shown on the 61J760026 drawing. (2) M-409/T-013 data cannot be restored.	b) None	b) (1) Ground requests that the crew switch the "EKG/ZPN" switch to the "ENABLE" position. This restores the Subframe 2 data input to the Exp 1 Rcdr but with a loss of certain Subframe 2 and Subframe 3 parameters. (2) Ground may not request a change in switch position but may determine that R/T subframe 2 is sufficient.	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) (1) With the "EKG/ZPN" switch in the "ENABLE" poriton, there is a loss of the Subframe 2 input signal to the Exp 1 Rcdr. (2) R/T Subframe 2 is not affected.	a) None	a) The ground observes a loss of recorded Subframe 2 data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) The Subframe 2 data input to the Exp 1 Rcdr can be restored but with a loss of the following parameters on Subframe 2 and 3: o Subframe 2 - M403 and M405. o Subframe 3 - M404, M406.	b) None	b) (1) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. This restores the Subframe 2 data input to the Exp 1 Rcdr but with a loss of certain Subframe 2 and Subframe 3 parameters. (2) Ground may not request a change in switch position but may determine that R/T Subframe 2 is sufficient.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relya, Latching, "EKG/ZPN Relay #2" (K3-374) (52-79703-61) (Continued)	M	a) Pole D fails open in the reset position.	a) There is a loss of the Korotkoff Sound Signal (N304) input to the Interface Box for Subframe 2. Note - This parameter has been deleted but is shown on 61J760026 drawing.	a) None	a) Ground observes a loss of the Korotkoff Sound Signal parameter (N304) in Subframe 2 R/T and delayed time.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of the Korotkoff Sound Signal in Subframe 2.	b) None	b) Ground informs crew of the anomaly.	b) IIIb	
	M	a) Pole D fails open in the latch position.	a) There is a loss of the Impedance Pneumograph, Channel A (M403), 40 s/s input to the Interface Box for Subframe 2 (R/T and delayed time).	a) None	a) Ground observes a loss of the Impedance Pneumogarph, Channel A (M403) parameter in Subframe 2.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of recorded M403 parameter. The M403 parameter is still available in the Master Frame.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. This switches the M403 parameter to the Master Frame for R/T TM.	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) (1) There is a loss of the TR clock and M-509/T-013 clock to the Exp 1 Rcdr. (2) R/T Subframe 2 is not affected.	a) None	a) Meaningless data is received when the Exp 1 Rcdr is dumped.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) The TR Clock signal to the Exp 1 Rcdr can be restored but with the loss of the following Subframe 2 and Subframe 3 parameters: o Subframe 2 - N301 and N304. o Subframe 3 - N302, N303, N307 and N308. (2) There is a loss of M-509/T-013 data.	b) None	b) (1) Ground requests that the crew switch the "EKG/ZPN" switch to the "ENABLE" position. This restores the T/R Clock input to the Exp 1 Rcdr but results in the loss of certain Subframe 2 and Subframe 3 parameters. (2) Ground may determine that R/T Subframe 2 is sufficient and not request that the crew change the switch position.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relya #2" (K3-374) (52-79703-61) (Continued)	M	a) Pole C fails open in the latch position.	a) (1) With the "EKG/ZPN" switch in the "ENABLE" position, there is a loss of the TR clock signal to the Exp 1 Rcdr. (2) R/T Subframe 2 data is not affected.	a) None	a) Meaningless Subframe 2 data is received from the Exp 1 Rcdr.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) The TR Clock signal to the Exp 1 Rcdr can be restored but with the loss of the following Subframe 2 and Subframe 3 parameters which will be switched to the Master Frame (R/T TM): o Subframe 2 - M403 and M405 o Subframe 3 - M404 and M406	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. This restores the affected parameters to the Master Frame.	b) IIIb	
	M	a) Latch coil fails open.	a) With the "EKG/ZPN" switch in the "ENABLE" position, there is a loss of the Impedance Pneumograph, Channel A (M403) and Electrocardiogram, Channel A (M405) inputs to the Interface Box for Subframe 2 (R/T and delayed time).	a) None	a) Ground observes a loss of the Impedance Pneumograph, Channel A (M403) and Electrocardiogram, Channel A (M405) parameters in Subframe 2 data (R/T and delayed time).	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) There is a loss of recorded data for parameters M403 and M405. These parameters can be made available in the Master Frame formal.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF psoition. The switches parameters M403, M404, M405 and M406 to the Master Frame.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EXG/ZPN Relay #2" (K3-374) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) Loss of the M-509/T-013 Data and Clock signals to the Exp 1 Rcdr.	a) None	a) Ground observes a loss of M-509/T013 data from the Exp 1 Rcdr.	a) N/A	---
		b) Defective wire or therminal due to mechanical or thermal stress.	b) Loss of M-509/T013 Experiment data.	b) None	b) Ground informs crew of the anomaly.	a) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "EKG/ZPN Relay #3" (K3-375) (52-79715-13) 3.4.55	M	a) (1) Pole B fails open when the coil is energized, or (2) The coil fails open.	a) When the "EKG/ZPN" switch is switched to the "OFF" position, Relays K3-373 and K3-374 do not cycle to the reset position. There is a loss of the Vectorcardiogram No.1 (N301), Karotkoff Sound Signal (N304) inputs to the Interface Box for Subframe 2 and a loss of M-509/T-013 Data and Clock inputs to the Exp 1 Rcdr. Note - N304 has been deleted but is shown on the 61J760026 drawing.	a) None	a) (1) Ground observes a loss of Vectorcardiogram No. 1 (N301) and the Korotkoff Sound Signal (N304 from Subframe 2 data (R/T and delayed time). In their locations are the Electrocardiogram, Channel A (M405) and the Impedance Pneumograph, Channel A, parameters respectively. (2) Ground observes a loss of M-509/T013 Experiment Data.	a) N/A	---
This relay is used in the switching of Relays K3-373 and K3-374.		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Loss of the N301, N304 parameters and M-509/T013 Experiment data.	b) None	b) Ground informs crew of the anomaly.	b) IIIb	
	M	a) (1) Pole A fails open when the coil is energized, or (2) The coil fails open.	a) When the "EKG/ZPN" switch is switched to the "ENABLE" position, Relays K3-373 and K3-374 do not cycle to the latch position. This results in a loss of Impedance Pneumograph, Channel A (M403) and Electrocardiogram Channel A (M405) inputs to the Interface Box for Subframe 2 (R/T and delayed time).	a) None	a) Ground observes a loss of Impedance Pneumograph, Channel A (M403) and Electrocardiogram, Channel A (M405) from Subframe 2 data (R/T and delayed time).	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "EKG/ZFN Relay #3" (K3-375) (52-79715-13) 3.4.55 (Continued)		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or therminal due to mechanical or thermal stress.	b) The M403 and M405 parameters are only available in R/T via the Master Frame.	b) None	b) Ground requests that the crew switch the "EKG/ZFN" switch to the "OFF" position. This puts the M403 thru M406 parameters in the Master Frame (R/T) instead of Subframes 2 and 3.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, EKG/ZPN Relay #4" (K3-376) (52-79703-61) 3.4.56	M	a) Pole F or Pole D fails open in the reset position.	a) None - Redundancy on Poles F and D respectively of Relay K3-377.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole F fails open in the latch position.	a) There is a loss of the Electrocardiogram, Channel B (M406) input to the Interface Box for Subframe 3 (R/T and delayed time).	a) None	a) Ground observes a loss of the Electrocardiogram, Channel B (M406) parameter in Subframe 3 (R/T and delayed time).	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) There is a loss of the M406 parameter in delayed time data. However, M406 can be switched to the Master Frame (R/T only).	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. This puts the M403 thru M406 parameters in the Master Frame (R/T) instead of Subframes 2 and 3.	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) There is a loss of the Electrocardiogram, Channel B (M406) input to the Interface Box for the Master Frame (R/T only).	a) None	a) Ground observes a loss of the Electrocardiogram Channel B (M406) parameter in the Master Frame.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) The M406 parameter can be switched to Subframe 3 (R/T and delayed time).	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "ENABLE" position. This switches the M403 thru M406 parameters to subframe 2 and 3 (R/T and delayed time).	b) IIIb	
	M	a) Pole E or Pole C fails open in the latch position.	a) None - Not functional in the latch positon.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relay #4" (K3-376) (52-79703-61)	M	a) Pole D fails open in the latch position.	a) There is a loss of the Impedance Pneumograph, Channel B (M404) input to the Interface Box for Subframe 3 (R/T and delayed time).	a) None	a) The ground observes a loss of the Impedance pneumograph, Channel B (M404) parameter in Subframe 3 (R/T and delayed time).	a) N/A	---
(Continued)		b) Insulating film on contacts due to contamination.	b) There is a loss of the M404 parameter in delayed time data. However, M406 can be switched to the Master Frame (R/T only).	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. This puts the M403 thru M406 parameters in the Master Frame (R/T) instead of Subframes 2 and 3.	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) There is a loss of the Impedance Pneumograph, Channel B (M404) input to the Interface Box for the Master Frame (R/T only).	a) None	a) The ground observes a loss of the Impedance Pneumograph, Channel B (M404) parameter in the Master Frame.	a) N/A	---
			b) There is a loss of the M404 parameter in the Master Frame. However, M404 can be switched to Subframe 3 (R/T and delayed time).	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "ENABLE" position. This puts the M403 thru M406 parameters in Subframes 2 and 3 (R/T and delayed time)	b) IIIb	
	M	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-377.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relay #4" (K3-376) (52-79703-61) (Continued)	M	a) Latch coil fails open.	a) When the "EKG/ZPN" switch is switched to the "ENABLE" position, Relay K3-376 does not latch. There is a loss of the Impedance Pneumograph, Channel B (M404) and the Electrocardiogram, Channel B (M406) parameters in Subframe 3 (R/T and delayed time). Instead, they are in the Master Frame (R/T only).	a) None	a) Ground observes that the Impedance Pneumograph, Channel B (M404) and Electrocardiogram, Channel B (M406) parameters are in the Master Frame instead of in Subframe 3.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) There is a loss of delayed time data for the M404 and 406 parameters.	b)	b) Ground informs crew of the anomaly.	b) IIIb	
	M	a) Reset coil fails open.	a) When the "EKG/ZPN" switch is switched to the "OFF" position, Relay K3-376 does not reset. These is a loss, of the Impedance Pneumograph, Channel B (M404) and the Electrocardiogram, Channel B (M406) parameters in the Master Frame (R/T only). Impedance Pneumograph, Channel B (M404), Vectorcardiogram No. 3 (N303) and the Photomultiplier Current (N308) inputs are to the same Interface Box channel, i.e. Channel I142. Electrocardiogram, Channel B (M406), Vectorcardiogram No. 2 (N302) and Polarizer Sync (N307) inputs are to the same Interface Box channel, i.e. Channel I141.	a) None	a) The ground observes a loss of the Impedance Pneumograph, Channel B (M404) and the Electrocardiogram, Channel B (M406) parameters in the Master Frame (R/T only). M404 and M406 appear in Subframe 3 (R/T and delayed time).	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relya, Latching, "EKG/ZPN Relay #4" (K3-376) (52-79703-61) (Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) M404 cannot be recorded whenever N303 (orN308) is being recorded. (2) M406 cannot be recorded whenever N302 or N307 is being recorded.	b) None	b) Ground may request that the crew switch the "EKG/ZPN" switch to the "ENABLE" position. This switches M403 thru M406 to the Master Frame (R/T only).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relay #5" (K3-377) (52-79703-61) 3.4.57	M	a) Pole F or Pole D fails open in the reset position.	a) None - Redundancy on Poles F and D respectively of Relays K3-376.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C or Pole D or Pole E or Pole F fails open in the latch position.	a) None - Not functional in this position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) Loss of power to the Exp 2 "RECORD" indicator lights in the OWS.	a) When the crew switches an "EXP 2" switch to the "RECORD" position, the OWS Exp 2 "RECORD" indicator lights do not come ON. The Exp 2 "RECORD" light on Panel 204 comes ON as expected.	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) Crew informs the ground of the anomaly.	b) None	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) Loss of power to the Exp 1 "RECORD" indicator lights in the OWS.	a) When the crew switches as "Exp 1" switch to the "RECORD" position, the OWS Exp 1 "RECORD" indicator lights do not come ON. The Exp 1 "RECORD" light on Panel 204 comes ON as expected.	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) Crew informs the ground of the anomaly	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relay #5" (K3-377) (52-79703-61) (Continued)	L M S	a) Pole B fails open in the reset or latch position.	a) None - Redundancy on Pole B of Relay K3-377.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) When the "EKG/ZPN" switch is switched to the "ENABLE" position, Relay K3-377 does not latch. Impedance Pneumograph, Channel B (M404) Vectorcardiogram No. 3 (N303) and the Photomultiplier Current (N308) inputs are to the same IB Channel, i.e. Channel I141. Power to the OWS Exp 1 and Exp 2 "RECORD" lights is not removed.	a) When the "EKG/ZPN" switch is switched to the "ENABLE" position while the Exp 1 and/or Exp 2 switch(es) is in the "RECORD" position, the OWS Exp 1 and/or Exp 2 "RECORD" lights do not extinguish as expected.	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or stress.	b) None. M404 and M406 are not recorded at the same time that N303 or N308 and N302 or N307 are being recorded. There should be not impedance problems (circuit loading).	b) Crew informs the ground of the anomaly	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "EKG/ZPN Relay #5" (K3-377) (52-79703-61) (Continued)	M	a) Reset coil fails open.	a) When the crew switches the "EKG/ZPN" switch to the "OFF" position, Relay K3-377 does not reset. There is a loss of power to the Exp 1 and Exp 2 Rcdr.	a) When the crew switches an Exp 1 and/or Exp 2 switch to the "RECORD" position, the OWS Exp 1 and/or Exp 2 "RECORD" indicator lights do not come ON. The AM Exp 1 and/or Exp 2 "RECORD" lights on Panel 204 come ON as expected.	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, other than the loss of the OWS Exp 1 and Exp 2 indicator lights.	b) Crew informs the ground of the anomaly	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "EKG/ZPN Relay #6" (K3-378) (52-79715-13) 3.4.58	M	a) (1) Pole B fails open when the coil is energized, or (2) Coil fails open.	a) When the "EKG/ZPN" switch is cycled to the "ENABLE" position, Relays K3-376 and K3-377 do not latch. The Impedance Pneumograph, Channel B (M404) and Electrocardiogram, Channel B (M406) inputs to the IB cannot be switched from the Master Frame to Subframe 3 for recording data. Power is not removed from the OWS Exp 1 and Exp 2 "RECORD" indicator lights.	a) When the crew switches the "EKG/ZPN" switch to the "ENABLE" position, the OWS Exp 1 and/or Exp 2 "RECORD" indicator lights do not extinguish as expected.	a) Ground observes the Impednace Pneumograph, Channel B (M404) and the Electrocardiogram, Channel B (M406) parameters are in the Master Frame rather than in Subframe 3.	a) N/A	---
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) The M404 and M406 parameters cannot be recorded. They are available only as R/T data.	b) Crew informs the ground of the anomaly.	b) Ground informs crew of the anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "EKG/ZPN Relay #6" (K3-378) (52-79715-13) (Continued)	M	a) (1) Pole A fails open when the coil is energized, or (2) Coil fails open.	a) When the "EKG/ZPN" switch is switched to the "OFF" position, Relays K3-376 and K3-377 do not reset. This results in the following effects: o Impedance Pneumograph, Channel B (M404) and Electrocardiogram, Channel B (M406) cannot be switched from Subframe 3 to the Master Frame. o There is a loss of Vectorcardiogram No. 2 (N302), Polarizer Sync (N307), Vectorcardiogram No. 3 (N303) and Photomultiplier Current (308) on Subframe 3. o There is a loss of power to the OWS Exp 1 and Exp 2 "RECORD" indicator lights.	a) When the crew switches an Exp 1 and/or Exp 2 switch to the "RECORD" position, the OWS Exp 1 and/or Exp 2 "RECORD" indicator lights do not come ON.	a) (1) Ground observes that M404 and M406 parameters are in Subframe 3 instead of the Master Frame. (2) Ground observes a loss of N302, N303, N307 and N308 parameters in Subframe 3.	a) N/A	---
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or therminal due to mechanical or thermal stress.	b) Loss of N302, N303, N307 and N308 data.	b) Crew informs the ground of the anomaly	b) Ground informs crew of the anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "EKG/ZPN" (Located on Panel 204) (52-79705-1) 3.4.59	M	a) Contact set (5,6) fails open in the "ENABLE" position.	a) When the "EKG/ZPN" switch is cycled to the "ENABLE" position, Relays K3-376 and K3-377 do not latch. The Impedance Pneumograph, Channel B (M404) and Electrocardiogram, Channel B (M404) and and Electrocardiogram, Channel B (406) inputs to the I/B cannot be switched from the Master Frame to Subframe 3 for recording data. Power is not removed from the OWS Exp 1 and Exp 2 "RECORD" indicator lights.	a) When the crew switches the "EKG/ZPN" switch to "ENABLE" position, the OWS Exp 1 and/or Exp 2 "RECORD" indicator lights do not extinguish as expected.	a) Ground observes the Impedance Pneumograph, Channel B (M404) and the Eletrocardiogram, Channel B (M406) parameters are in the Master Frame rather than in Subframe 3.	a) N/A	---
This switch is used in the recording of EKG/ZPN data.		b) Insulating film on contacts due to contamination.	b) The M404 and M406 parameters cannot be recorded. They are available only as R/T data.	b) Crew informs the ground of the anomaly.	b) Ground informs crew of the anomaly.	b) IIIb	
	M	a) Contact set (5, 4) fails open in the "OFF" position.	a) When the "EKG/ZPN" switch is switched to the "OFF" position, Relays K3-376 and K3-377 do not reset. This results in the following effects: o Impedance Pneumograph, Channel B (M404) and Electrocardiogram, Channel B (M404) and Electrocardiogram, Channel B (M406) cannot be switched from Subframe 3 to the Master Frame. o There is a loss of Vectorcardiogram No. 2 (N302), Polarizer Sync (N307), Vectorcardiogram No. 3 (N303) and Photomultiplier Current (N308) on Subframe 3. o There is a loss of power to the OWS Exp 1 and Exp 2 "RECORD" indicator lights.	a) When the crew switches an Exp 1 and/or Exp 2 switch to the "RECORD" position, the OWS Exp 1 and/or Exp 2 "RECORD" indicator lights do not come ON.	a) (1) Ground observes that M404 and M406 parameters are in Subframe 3 instead of the Master Frame. (2) Ground observes a loss of N302, N303, N307 and N308 parameters in Subframe 3.	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle. "EKG/ZPN" (Located on Panel 204) (52-79705-1)		b) Insulating film on contacts due to contamination.	b) Loss of N302, N303, N307 and N308 data.	b) Crew informs the ground of the anomaly.	b) Ground informs crew of the anomaly.	b) IIIb	
(Continued)		a) Contact set (2,1) fails open in the "OFF" position.	a) When the "EKG/ZPN" switch is switched to the "OFF" position Relays K3-373 and K3-375 do not cycled to the reset position. There is a loss of the Vectorcardiogram No. 1 (N301), Korotkoff Sound Signal (N304) inputsto the Interface Box for Subframe 2 and a loss of M-509/T-013 Data and Clock inputs to the Exp 1 Rcdr. Note - N304 has been deleted but is shown on the 61J760026 drawing.	a) None	a) (1) Ground observes a loss of Vectorcardiogram No. 1 (N301) and the Korotkoff Sound Signal (N304) from Subframe 2 data (R/T and delayed time). In their locations are the Electrocardiogram, Channel A (M405) and the Impedance Pneumograph, Channel A, parameters respectively. (2) Ground observes a loss of M-509/T-013 Experiment Data.	a) N/A	---
		b) Insulating On contacts due to contamination.	b) Loss of the N301, N304 parameters and M-509/T013 Experiment data.	b) None	b) Ground informs crew of the anomaly.	b) IIIb	
		a) Contact set (2,3) fails open in the "ENABLE" position.	a) When the "EKG/ZPN" switch is switched to the "ENABLE" position, Relays K3-373 and K3-375 do not cycle to the latch position. This results in a loss of Impedance Pneumograph, Channel A (M403) and Electrocardiogram, Channel A (M405) inputs to the Interface Box for Subframe 2 (R/T and delayed time).	a) None	a) Ground observes a loss of Impedance Pneumograph, Channel A (M403) and Electrocardiogram, Channel A (M405) from Subframe 2 data (R/T and delayed time).	a) N/A	---

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Toggle, "EKG/ZPN: (Located on Panel 204) (52-79705-1) (Continued)		b) Insulating film on contacts due to contamination.	b) The M403 and M405 parameters are only available in R/T via the Master Frame.	b) None	b) Ground requests that the crew switch the "EKG/ZPN" switch to the "OFF" position. This puts the M403 thru M406 parameters in the Master Frame (R/T) instead of Subframes 2 and 3.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Normal, " Data Rcdr Fast Forward Relay" (K3-372) (52-79703-1) 3.4.60	M	a) Pole A fails open when the coil is unenergized.	a) There is a loss of power to the Voice Record indicator lights in the MDA, AM and OWS.	a) When the crew records Voice, the Voice Record indicator lights in the MDA, AM and OWS do not come ON.	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) Loss of Voice Record indication for the remainder of the mission.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	a) Ground verifies on R/T TM that the Rcdr for recording voice has tape motion.	b) IIIb	
	M	a) (1) Pole A fails open when the coil is energized, or (2) The coil fails open.	a) There is a loss of power to the relay logic for locking out power to the Voice Record indicator lights in the MDA, AM and OWS when the ground gives the Data Rcdr Fast Forward ON (2-1) command.	a) When the ground Fast Forwards the Data Rcdr, the Voice Record indicator lights in the MDA, AM and OWS do not extinguish to inform the crew that voice is not being recorded.	a) None	a) N/A	---
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Possible lost of some recorded voice when the ground Fast Forwards the Data Rcdr.	b) If crew knew the ground was Fast Forwarding the Data Rcdr, they inform ground that the Voice Record indicator lights did not turn off.	b) None	b) IIIb	
	L M S	a) Pole B fails open in either position.	a) None - Spare pole	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, "INSTRUMENTATION SYSTEM - RECORDER AUDIO" (Located on Panel 204) (52-79705-1)	M	a) Contact set (2,3) fails open with the switch in the "A" position.	a) Crew cannot switch from Audio Load B Compensator No. 2 to Audio Load A Compensator No. 1 for voice recording.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The system is in the "A" mode at lift-off and remains in that mode for a normal mission.	b) None.	b) None.	b) IIIb	
3.5.01 This switch is used for crew selection of Audio Load A Compensator No. 1 or Audio Load B Compensator No. 2.	M	a) Contact set (5, 6) fails open with the switch in the "A" position.	a) None. This contact set is not functional.	a) None.	a) None.	a) None.	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Contact set (5, 4) fails open in the "B" position.	a) Crew cannot switch from Audio Load A Compensator No. 1 to Audio Load B Compensator No. 2 for voice recording.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Audio Load B Compensator No. 2 is needed only in the event of a prior failure, which results in a loss of Audio Load A Compensator No. 1.	b) None.	b) None.	b) N/A - Double failure.	
	M	a) Contact set (3, 1) fails open with the switch in the "B" position.	a) None. This contact set is not functional.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Audio Select Relay #1" (K3-111) (52-79703-61) 3.5.02	M	a) Reset coil fails open.	a) Crew cannot switch from Audio Load Compensator B to Audio Load Compensator A.	a) None.	a) None.	a) N/A	-----
		b) Defective wire or terminal due to mechanical or thermal shock.	b) None. "RECORDER AUDIO" switch (located on Panel 204) will be in the "A" position at lift-off and will remain in this position for a nominal mission.	b) None.	b) None.	b) IIIb	
	M	a) Latch coil fails open.	a) Crew cannot switch from Audio Load Compensator A to Audio Load Compensator B.	a) None.	a) Ground observes a loss of recorded voice.	a) N/A	-----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) If there is a failure involving Audio Load Compensator A, then there is a loss of voice recording capability.	b) None.	b) Ground informs the crew of the anomaly.	b) N/A - Double failure.	
This relay is used to select the Audio Load Compensator to be used for Voice recording. Reset position, Compensator A, Latch position, Compensator B.	M	a) Pole A used for GSE only - No effect.	a) None.	a) None.	a) None.	a) N/A	-----
	M	a) Pole B fails open in the reset position.	a) Crew cannot switch from Audio Load Compensator A to Audio Load Compensator B.	a) None.	a) Ground observes a loss of recorded voice.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) If there is a failure involving Audio Load Compensator A, then there is a loss of voice recording capability.	b) None.	b) Ground informs the crew of the anomaly.	b) N/A - Double failure.	
	M	a) Pole E is a spare - No effect.	a) None.	a) None.	a) None.	a) N/A	-----
	M	a) Pole B fails open in the latch position.	a) Crew cannot switch from Audio Load Compensator B to Audio Load Compensator A.	a) None.	a) None.	a) N/A	-----
		b) Insulating film on contacts due to contamination.	b) None, "RECORDER AUDIO" switch will be in the "A" position at liftoff and will remain in this position for a nominal mission.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Recorder Audio Select Relay #1" (K3-111) (52-79703-61) (Continued)	M	a) Pole F (or Pole D or Pole C) fails open in the reset position.	a) Loss of Voice Record capability on Tape Recorder #1 (or #2 or #3). Voice recording capability on the other Tape Recorders is not affected.	a) None.	a) Loss of recorded voice from the affected Recorder.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) None. Recorded Voice can be obtained from either one of the other two Recorders. (2) If desired, ground or crew can perform switching to change Recorder/Data assignments. (3) Also, crew can switch the "RECORDER AUDIO" switch (located on Panel 204) to the "B" position. This restores the Voice record capability.	b) None.	b) (1) Ground switches the Recorder/Data assignments, or (2) Ground requests that the crew perform switching to desired Recorder/Data assignments. or (3) Ground requests that crew switch the "RECORDER AUDIO" switch (located on Panel 204) to the "B" position.	b) IIIb	
		a) Pole F (or Pole D or Pole C) fails open in the latch position.	a) In the event of a failure of Audio Load Compensator A, there is a loss of Voice Record capability on Tape Recorder #1 (or #2 or #3) when the "RECORDER AUDIO" switch is switched to the "B" position. Voice recording capability on the other Tape Recorders is not affected.	a) None.	a) Loss of recorded voice from the affected Recorder.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) None. Recorded Voice can be obtained from either one of the other two Recorders. (2) If desired, ground or crew can perform switching to change Recorder/Data assignments.	b) None.	b) (1) Ground switches the Recorder/Data assignments, or (2) Ground requests that the crew perform switching to desired Recorder/Data assignments.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Recorder Audio Select Relay #3" (K3-113) (52-79715-11) 3.5.03 This relay used to select the Audio Load Compensator to be used for Voice recording.	M	a) With Relay K3-111 in the reset position; (1) Coil fails open, or (2) Pole A fails open when the coil is energized.	a) Crew cannot switch from Audio Load Compensator A to Audio Load Compensator B for Voice Recording.	a) None.	a) Ground observes a loss of recorded Voice.	a) N/A	----
		b) (1) Defective wire or terminal due to mechanical or thermal stress, or (2) Insulating film on contacts due to contamination.	b) None. Audio Load Compensator B will be used for Voice recording only in the event of a Voice recording failure using Audio Load Compensator A.	b) None.	b) Ground informs crew of the anomaly.	b) N/A - Double failure.	
		a) (1) With Relay K3-111 in the latch position; (1) Coil fails open, or (2) Pole A fails open when the coil is energized.	a) Crew cannot switch from Audio Load Compensator B to Audio Load Compensator A for Voice Recording.	a) None.	a) Ground observes a loss of recorded Voice.	a) N/A	----
		b) (1) Defective wire or terminal due to mechanical or thermal stress, or (2) Insulting film on contacts due to contamination.	b) None. "RECORDER AUDIO" switch will be in the "A" position at lift-off and is expected to remain in this position for a nominal mission.	b) None.	b) Ground informs crew of the anomaly.	b) N/A - Double failure.	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Power Relay #2" (K3-273) (52-79703-61) 3.5.06	M	a) Reset coil fails open.	a) (1) When the PCM Bus (normally Bus A) is powered-up, power is not applied to those panel indicator sensors, which require display power. (2) Power to Caution and Warning Sensors is not affected. (3) Sensors using raw bus power are not affected.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "PPCO$_2$" "IN" indicators (located on Panel 203). o The O$_2$/N$_2$ bottle pressure and temperature, the O$_2$/N$_2$ pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on Panel 216). o The "LOCK", "AFT" and "O$_2$" pressure indicators (located on Panel 316).	a) Loss of data for the Mole Sieve PCO$_2$ Inlet (D209 and/or D213) parameters. Normal readings are observed for the Mole Sieve PCO$_2$ Outlet (D210 and/or D214) parameters.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) None. Power to sensors is restored when PCM Bus is powered down. (2) Most of the affected parameters are available on TM.	b) (1) Crew checks the switches and circuit breakers of associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly. (3) Crew requests that ground monitor affected parameters on TM.	b) Ground coordinates with crew to determine cause of observed anomaly and necessary corrective action.	b) IIIb	
	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A.	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Power Relay #2" (K3-273) (52-79703-61) (Continued)	M	a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided on Pole B of Relay K3-272.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Latch coil fails open.	a) (1) When the PCM Bus (normally Bus A) is powered-down, display power is not supplied to the panel indicator sensors. (2) Power to Caution and Warning Sensors is not affected. (3) Sensors using raw bus power are not affected.	a) The following panel indicators assume the no power (rest) position: o The 'HT EXCH" and "PPCO IN" indicators (located on Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on Panel 225). o The 'TANK ΔP" and "VENT TEMP" indicators (located on Panel 216). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) None. Power to sensors is restored when the PCM Bus is powered-up. (2) Power to the Display Converters cannot be restored.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause to anomaly. (2) Crew informs ground of the anomaly.	b) Ground coordinates with the crew to determine the cause of observed anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Power Relay #2" (K3-273) (52-79703-61) (Continued)	M	a) Pole C fails open in the latch position.	a) Loss of +5 VDC Display Converter power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-down.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None	a) N/A.	- - -
		b) Insulating film on contacts due to contamination.	b) None, +5 VDC display power is restored when the PCM Bus is powered-up.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew switches to the Secondary Display Conv.; this does not correct the problem.	b) Ground coordinates with crew to determine cause of observed anomaly.	b) IIIb	
	M	a) Pole C fails open in the reset position.	a) (1) Loss of +5 VDC display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-up. (2) Power to Caution and Warning Sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None.	a) N/A.	- - -
		b) Insulating film on contacts due to contamination.	b) (1) None. Crew can monitor indicators when the PCM Bus is powered-down. (2) Parameters for affected meters are available on TM.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) Ground coordinates with crew to determine cause of observed anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Power Relay #2 (K3-273) (52-79703-61) (Continued)	M	a) Pole D fails open in the latch position.	a) Loss of +24 VDC Display Converter power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-down.	a) The following panel indicators assume the no power (rest) position: o The "$PFCO_2$ IN" and "HT, EXCH" indicators (located on Panel 203). o The O_2/N_2 bottle temperature indicators (Located on Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on Panel 216).	a) None.	a) N/A.	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) Ground coordinates with crew to determine cause of observed anomaly.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) (1) Loss of +24 VDC display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-up. (2) Power to the Caution and Warning Sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The "$PFCO_2$ IN" and "HT EXCH" indicators (located on Panel 203). o The O_2/N_2 bottle temperature indicators (located on Panel 225). o The "TANK Δ P" and "VENT TEMP" indicators (located on Panel 216).	a) Zero pressure is observed for the Mole Sieve PCO_2 Inlet parameters (D209 or D213). Normal readings are observed for the Mole Sieve PCO_2 Outlet parameters (D210 or D214).	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) None. Crew can monitor indicators when the PCM Bus is powered-down. (2) Parameters for most of the affected meters are available on TM.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) Ground coordinates with crew to determine cause of observed anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Power Relay #2" (K3-272) (52-79703-61) (Continued)	M	a) Pole E fails open in the latch position.	a) (1) Loss of -24 VDC Display Converter power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-down. (2) Power to Caution and Warning Sensors is not affected.	a) Questionable readings on the "$PPCO_2$ IN" indicator (located on Panel 203). Normal readings on the "$PPCO_2$ OUT" indicator.	a) None.	a) N/A.	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew can monitor affected indicator(s) when the PCM Bus is powered-up. Power to the Mole Sieve $PPCO_2$ Outlet Sensors is not affected.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) Ground coordinates with the crew to determine the cause of the observed anomaly.	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) (1) Loss of -24 VDC display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-up. (2) Power to Caution and Warning Sensors is not affected.	a) Questionable readings on the "$PPCO_2$ IN" indicator (located on Panel 203). Normal readings on the "$PPCO_2$ OUT" indicator.	a) Questionable data is observed for the Mole Sieve PCO_2 Inlet parameters (D209 or D213). Normal readings are observed for the Mole Sieve PCO_2 Outlet parameters (D210 or D214).	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Crew can monitor affected indicator(s) when the PCM Bus is powered-down. Power to the Mole Sieve $PPCO_2$ Outlet Sensors is not affected.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) Ground coordinates with the crew to determine the cause of the observed anomaly.	b) IIIb	
	M	a) Pole F fails open in the reset or latch position.	a) None - Pole F is a spare.	a) None.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Power Relay #1" (K3-272) (52-79703-45) 3.5.07	M	a) Reset coil fails open.	a) (1) When the PCM Bus (normally Bus A) is powered-up, power is not removed from the Display Conv. the Display Conv. will operate into an open load. Display power to the panel indicator sensors is not affected.	a) None	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Operating into an open load will not damage the Display Conv.	b) None	b) None	b) None	b) IIIb
	M	a) Latch coil fails open.	a) (1) When the PCM Bus (normally Bus A) is powered-down, AM Bus power is not applied to the programmed Display Conv. This results in a loss of display power to the panel indicator sensors. (2) Power to the Caution and Warning Sensors is not affected. (3) Power to the affected sensors is restored when the PCM Bus is powered-up.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "PPCO$_2$ IN" indicators (located on Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on Panel 225). o The "TANKΔP" and "VENT TEMP" indicators (located on Panel 216). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None	a) None	a) N/A
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly. (3) Normal readings are observed when Bus A is powered-up.	b) None	b) IIIb	

*COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW c) INDICATION d) ACTION	GROUND a) INDICATION b) ACTION	e) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Power Relay #1" (K3-272) (52-79703-45) (Continued)	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided on Pole B of Relay K3-273.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole C or Pole L fails open in the reset position.	a) None. These poles are not functional in the reset position.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) None. The latch position for this pole is functional only in the event of a prior failure which has disabled the Primary Display Conv.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) None	b) IIIb

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Power Relay #1" (K3-272) (52-79703-45) (Continued)	M	a) Pole D fails open in the latch position.	a) (1) When the PCM Bus (normally Bus A) is powered-down, AM Bus power is not applied to the Display Power Conv. This results in a loss of power to the panel indicator sensors, which require display power. (2) Power to the Caution and Warning Sensors is not affected.	a) The following panel indicators assume to no power (rest) position: o The "HT EXCH" and "$PPCO_2$ IN" indicators (located on Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on Panel 225). o The "TANK ΔP" and "VENT TEMP indicators (located on Panel 216). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Power to the panel indicator sensors is restored when the PCM Bus is powered-up.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly. (3) Crew switches the "DISPLAY CONV" switch (located on Panel 204) to the "SEC" position. This restores display power to the affected sensors.	b) Ground coordinates with the crew to determine the cause of the anomaly.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Display Power Relay #3" (K3-204) (52-79715-13) 3.5.08 This Relay is used to control Display Power Relay Nos. 1 and 2.	M	a) When Relays K3-272 and K3-273 are in the reset position; (1) Coil fails open, or (2) Pole A fails open when the coil is energized.	a) (1) Relays K3-272 and K3-273 cannot be cycled to the latch position. (2) When the PCM Bus (normally Bus A) is powered-down, power is not applied to the designated Display Power Conv. This results in a loss of display power to the panel indicator sensors. (3) Power to the Caution and Warning Sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The "HT EXCH" and "PPCO$_2$ IN" indicators (located on Panel 203). o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK" and "AFT" pressure indicators (located on Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on Panel 216). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None.	a) N/A	- - -
		b) (1) Defective wire or terminal due to mechanical or thermal stress, or (2) Insulating film on contacts due to contamination.	b) (1) None. Display power to the panel indicator sensors is restored when the PCM Bus is powered-up.	b) (1) Crew checks the switches and circuit breakers of associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) None.	b) IIIb	
	M	a) When Relays K3-272 and K3-273 are in the latch position; (1) Coil fails open, or (2) Pole B fails open when the coil is energized.	a) (1) Relays Ke-272 and K3-273 cannot be cycled to the reset position. (2) When the PCM Bus (normally Bus A) is not removed from the Display Power Conv. Power to the panel indicator sensors is not affected.	a) None	a) None.	a) N/A	- - -
		b) (1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) (1) None. The Display Power Conv. is designed to withstand continuous operation.	b) None	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	c) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Converter Select Relay #1" (KJ-262) (52-79703-61) 3.5.09	M	a) Reset coil fails open.	a) None. This relay is in the reset position (Primary Display Converter) at lift-off and remains in this position for a normal mission.	a) None	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	M	a) Latch coil fails open.	a) Crew cannot switch from the Primary to the Secondary Display Converter.	a) None	a) None	a) N/A	- - -
This relay is used in conjunction with crew selection of the Primary or Secondary Display Converter.		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. The Secondary Display Converter is used only in the event of a prior failure, which has disabled the Primary Display Converter.	b) None	b) None	b) N/A - Double failure	
		a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None	b) IIIb	
	M	a) Pole B fails open in the reset position.	a) Crew cannot switch from the Primary to the Secondary Display Converter.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The Secondary Display Converter is used only in the event of a prior failure which has disabled the Primary Display Converter.	b) None.	b) None.	b) N/A - Double failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Converter Select Relay #1" (K3-262) (52-79703-61) (continued)	M	a) Pole C fails open in the reset position.	a) (1) There is a loss of +5 VDC display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-down. (2) Power to the Caution and Warning Sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) (1) None. The +5 VDC display power is restored to the panel indicator sensors when the PCM Bus is powered-up. (2) Crew can switch to the Secondary Display Converter.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly. Crew switches to the Secondary Display Conv.	b) None.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) (1) There is a loss of -24 VDC display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered down. (2) Power to the Caution and Warning Sensors is not affected.	a) Questionable readings on the "$PPCO_2$ IN" indicator (located on Panel 203).	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) None. The -24 VDC display power is restored to the panel indicator sensors when the PCM Bus is powered-up. (2) Crew can switch to the Secondary Display Converter.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly. Crew switches to the Secondary Display Converter.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Converter Select Relay #1" (KJ-262) (52-79703-61) (Continued)	M	a) Pole B fails open in the latch position.	a) Crew cannot select the Primary Display Converter for panel indicator sensor power.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The relay is in the reset (Primary Display Conv.) at lift-off and remains in this position for a normal mission.	a) None.	a) None.	b) IIIb	
	M	a) Pole E fails open in the reset position.	a) (1) There is a loss of +24 VDC display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-down. (2) Power to the Caution and Warning Sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The "PPCO$_2$ IN" and "HT EXCH" indicators (located on Panel 203). o The O_2/N_2 bottle temperature indicators (located on Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on Panel 216).	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) None. The +24 VDC display power is restored to the panel indicator sensors when the PCM Bus is powered-up. (2) Crew can switch to the Secondary Display Converter.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly. Crew switches to the Secondary Display Converter.	b) None.	b) IIIb	
	M	a) Pole F fails open in the reset or latch position.	a) None - Pole F is not functional.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Display Converter Select Relay #1" (K3-262) (52-79703-61) (Continued)	M	a) Pole C or Pole D or Pole E fails open in the latch position.	a) Crew cannot select the Secondary Display Converter for panel indicator sensor power.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. The Secondary Display Crew is needed only in the event of a prior failure which results in a loss of display power from the Primary Display Converter.	b) None	b) None	b) N/A - Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Fuse, 4.2 Amps (3-116) (52-79720-322) 3.5.10	M	a) Opens before nominal rated current is exceeded.	a) (1) There is a loss of +5 VDC Bus A display power. This results in a loss of +5 VDC display power to the panel indicator sensors during periods when the PCM Bus (normally Bus A) is powered-up. (2) Power for TM data from the sensors is not affected. (3) Power to the Caution and Warning Sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None	a) N/A	- - -
		b) Mechanical or thermal stress.	b) None. Ground can perform switching to circumvent the failure.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to Bus B for the PCM Bus and Bus A for the Experiment Recorders. (2) Ground also switches the Group 1 and Group 2 Transducers to Bus B power.	b) IIIb	
Fuse, 4.2 Amps (3-117) (52-79720-322) 3.5.11	M	a) Opens before nominal rated current is exceeded.	a) (1) There is a loss of -24 VDC Bus A display power. This results in a loss of -24 VDC display power to the panel indicator sensors during periods when the PCM Bus (normally Bus A) is powered up. (2) Power to the Caution and Warning Sensors is not affected.	a) Questionable reading on the "$PPCO_2$ IN" indicator (located on Panel 203).	a) Questionable data for the Mole Sieve PCO_2 Inlet (D209 and/or D213) parameters. Normal readings are observed for the Mole Sieve PCO_2 Outlet (D210 and/or D214) parameters.	a) N/A	- - -
		b) Mechanical or thermal stress.	b) None. Ground can perform switching to circumvent the failure.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to Bus B for the PCM Bus and Bus A for the Experiment Recorders. (2) Ground also switches the Group 1 and Group 2 Transducers to Bus B power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILUPE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Fuse, 4.2 Amps (3-118) (52-79720-322) 3.5.12	A	a) Opens before nominal rated current is exceeded.	a) (1) There is a loss of +24 VDC Bus A display power. This results in a loss of +24 VDC display power to the panel indicator sensors during periods when the PCM Bus (normally Bus A) is powered-up. (2) Power for TM data from most of the sensors is not affected. (3) Power for the Caution and Warning Sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The "$PPCO_2$ IN" and "HT EXCH" indicators (located on Panel 203). o The O_2/N_2 bottle temperature indicators (located on Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on Panel 216).	a) No power readings for the following parameters: o Mole Sieve A and B PCO_2 Inlet (D209 and D213). o H_2O Condensate Tank - Diff. Press (D208).	a) N/A	- - -
		b) Mechanical or thermal stress.	b) None. Ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground switches to Bus B for the PCM Bus and Bus A for the Experiment Recorders. (2) Ground switches the Group 1 and Group 2 Transducers to Bus B power.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DISPLAY POWER PRI" (3-61) (Located on Panel 200) (52-79721-322) 3.5.18	M	a) Opens before normal break current is exceeded. (Continued on next page)	a) (1) Loss of power to the Primary Display Converter. This results in a loss of display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-down. This assumes a normal mission with the system configured to the Primary Display Converter. (2) Loss of capability to switch from the Secondary to the Primary Display Converter. (3) Loss of power for switching the "MOLECULAR SIEVE" panel indicators (located on Panel 203) from Mole Sieve B to Mole Sieve A. (4) TM data from the Mole Sieve type sensors is not affected. (5) Loss of power to the CWS pressure sensor for display of CWS pressure on Panels 225 and 316. (6) Loss of AM Bus 1 power to the following equipment: o Mole Sieve A Dew Point Control Unit. o Sensor for Mole Sieve A Compressor differtial pressure. o AM Cooling Bay Gas Flowmeter. (7) Loss of capability to switch the "VENT TEMP" indicator (located on Panel 216) from the Condensate Dump Sec. Temp. sensor to the Condensate Dump Pri. Temp. Sensor.	a) (1) Assuming the system is configured for the Primary Display Converter, when the PCM Bus is powered-down, the following panel indicators assume the no power (rest) position: o The "HT EXCH" and "PPCO$_2$ IN" indicators (located on Panel 203. o The O_2/N_2 bottle pressure and temperature, the O_2/N_2 pressure (200/225 PSI), and the "FWD", "LOCK", and "AFT" and "CWS" pressure indicators (located on Panel 225). o The "TANK Δ P" and "VENT TEMP" indicators (located on Panel 216). o The "LOCK", "AFT", "O_2" and "CWS" pressure indicators (located on Panel 316). (2) With Mole Sieve A operating, if the "DISPLAY" switch (located on Panel 203) is switched from "SIEVE B" to "SIEVE A", questionable readings are indicated on the "PPCO$_2$ IN" and "PPCO$_2$ OUT" indicators (located on Panel 203). (3) If the "DISPLAY" switch is switched from the "SIEVE B" to the "SIEVE A" position when Sieve A is baked out, the "BED" temperature indicator (located on Panel 203) does not indicate an increasing temperature. (4) No power reading on the Mole Sieve A "DEW PT." [illegible] ind. [illegible] on Pnl 203)	a) (1) Zero reading for the "Mole Sieve A -Comp. Delta" pressure (D212) (2) Zero reading for the "FLOW - AM Cooling Bay Flow" parameter (F209) (3) Zero reading for the "Mole Sieve A - Dew Point 1" parameter (C207).	a) N/A	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DISPLAY POWER PRI" (3-61) (Located on Panel 200) (52-79721-322) (Continued)		b) Internal defect, coil short to ground.	b) None. Crew can switch to the Secondary Display Converter. Mole Sieve B can be used instead of Mole Sieve A. If necessary, Mole Sieve A can be operated without the panel indicator readouts. Essential Mole Sieve parameters are available on TM. Readout of OWS pressure is not mission essential. Secondary Condensate Tank Vent can be used for condensate dump.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew attempts to reset the "DISPLAY POWER PRI" circuit breaker. (3) Crew informs ground of the anomaly. (4) Crew switches to the Secondary Display Conv. (5) Crew uses Secondary Vent when dumping the Condensate Tank. (6) Crew switches to the Mole Sieve B if deemed necessary.	b) (1) Ground coordinates with the crew in determining what on-board switching and operating procedures are necessary for mission continuation.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DISPLAY POWER SEC" (3-104) (Located on Panel 200) (52-79721-322) 3.5.19	M	a) Opens before normal break current is exceeded.	a) (1) Loss of power for the Secondary Display Conv. No effect during a normal mission as the system will be configured for the Primary Display Converter. (2) Loss of power for switching the "MOLECULAR SIEVE" panel indicators (located on Panel 203) from Mole Sieve A to Mole Sieve B. (3) Loss of capability to switch the "VENT TEMP" indicator (located on Panel 216) from the Condensate Dump Pri Temp sensor to the Condensate Dump Sec Temp sensor. No effect as the Pri Vent Valve is used during a normal mission. (4) Loss of AM Bus 2 power to the following equipment: o Mole Sieve B Dew Point Control Unit. o Sensor for Mole Sieve B Compressor differential pressure. (5) Loss of capability to switch from the Primary to the Secondary Display Conv. No effect. Only the Primary Display Conv. is used during a normal mission.	a) (1) If the "DISPLAY" switch (located on Panel 203) is switched from "SIEVE A" to the "SIEVE B" position when Sieve B is baked out, the "BED" temperature indicator (located on Panel 203) does not indicate an increasing temperature. (2) No power reading on the Mole Sieve B "DEW PT." panel indicator (located on Panel 203). (3) With Mole Sieve B operating, if the "DISPLAY" switch (located on Panel 203) is switched from "SIEVE A" to the "SIEVE B" position, questionable readings are indicated on the "PPCO$_2$ IN" and "PPCO$_2$ OUT" indicators (located on Panel 203).	a) (1) Zero reading for the "Mole Sieve B - Comp. Delta" pressure (D216). (2) Zero reading for the "Mole Sieve B - Dew Point 1" parameter (C215).	a) N/A	----
		b) Internal defect, coil short to ground.	b) None. If necessary, Mole Sieve B can be operated without the panel indicator readouts. Essential Mole Sieve parameters are available on TM.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew attempts to reset the "DISPLAY POWER SEC" circuit breakers. (3) Crew informs ground of the anomaly.	b) (1) Ground coordinates with the crew in determining what on-board switching and operating procedures are necessary for mission continuation.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #5" (K3-307) (52-79703-61) 3.5.20	M	a) Pole E fails open in the reset position.	a) There is a loss of -24 VDC display power when Bus A (normally the PCM Bus) is powered-up. This results in a loss of -24 volt power to the $PPCO_2$ inlet sensors for TM and the panel indicator.	a) Questionable reading on the "$PPCO_2$ IN" indicator (located on Panel 203). Normal reading on the "$PPCO_2$ OUT" indicator.	a) Questionable data for the Mole Sieve PCO_2 Inlet parameters (D209 and D213). Normal data is observed for the Mole Sieve PCO_2 Outlet parameters (D210 and D214).	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem. Also, the Inlet $PPCO_2$ reading is not a mission essential parameter.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the failure. (2) Crew informs the ground of the anomaly.	b) (1) Ground switches to Bus B power for the PCM System and the Group 1 and Group 2 Transducers. This switches the Experiment Recorders to Bus A power and restores power to the $PPCO_2$ Inlet sensors.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) There is a loss of +24 VDC display power to the panel indicator sensors when Bus A (normally the PCM Bus) is powered-up. TM data is not affected except for the Mole Sieve Inlet $PPCO_2$.	a) The following panel indicators assume the no power (rest) position: o The "$PPCO_2$ IN" and "HT EXCH" indicators (located on Panel 203). o The O_2/N_2 bottle temperature indicators (located on Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on Panel 216).	a) Zero readings are observed for the Mole Sieve PCO_2 Inlet parameters (D209 and D213). Normal data is observed for the other TM parameters associated with those displayed on the panel indicators.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs the ground of the anomaly.	b) (1) Ground switches to Bus B power for the PCM System and the Group 1 and Group 2 Transducers. This switches the Experiment Recorders to Bus A power and restores +24 volt power to the panel indicator sensors.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #5" (KJ-307) (52-79703-61) (Continued)	M	a) Pole C fails open in the reset position.	a) There is a loss of +5 VDC display power to the panel indicator sensors when Bus A (normally the PCM Bus) is powered-up. Power for TM data is not affected.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on Panel 225). o The "LOCK", "AFT", and "O_2" pressure indicators (located on Panel 316).	a) None. TM data is not affected.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) Ground switches to Bus B power for the PCM System and the Group 1 and Group 2 Transducers. This switches the Experiment Recorders to Bus A power. This restores +5 volt power to the panel indicator sensors.	a) IIIb	
	L M S	a) Pole F or Pole A open in the reset or latch position.	a) None - Pole F is a spare and Pole A is for GSE only.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) Loss of data input signal to Channel A of the Exp. 2 Recorder. This results in a loss of recorded Subframe 3 and Subframe 4 data. R/T Subframe 3 and Subframe 4 is not affected.	a) None.	a) Ground observes a loss of recorded Subframe 3 and Subframe 4 data.	a) N/A	
		b) Insulating film on contacts due to contamination.	b) None. Ground can perform switching to circumvent the problem.	b) None.	b) Ground switches to Bus B power for the PCM System and the Group 1 and Group 2 Transducers. This switches the Experiment Recorders to Bus A power and restores Subframe 3 and Subframe 4 recording capability.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #5" (K3-307) (52-79703-61) (Continued)	L M S	a) Reset coil fails open.	a) None. Relay is in the reset position at lift-off and remains in this position for a normal mission.	a) None.	a) None.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) (1) Latch coil fails open, or (2) Pole B or Pole C or Pole D or Pole E fails open in the latch position.	a) None. The relay is cycled to the latch position only in the event of a prior failure which requires that the PCM System be switched to Bus B power.	a) None.	a) None.	a) N/A	- - -
		b) (1) Defective wire or terminal due to mechanical or thermal stress (2) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) N/A - Double Failure	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DISPLAY CONVERTERS OUTPUT - 24V" (3-79) (52-79721-322)	M	a) Opens before normal break current is exceeded.	a) (1) Loss of -24 VDC display power to the Mole Sieve A and B Inlet $PPCO_2$ sensors. (2) Power to the Mole Sieve A and B Outlet $PPCO_2$ sensors is not affected.	a) Questionable readings on the "$PPCO_2$ IN" indicator (located on Panel 203).	a) Questionable data for the Mole Sieve A and B PCO_2 Inlet parameters (D209 and D213).	a) N/A	- - -
(3.9 amps) 3.5.21		b) Internal defect, coil short to ground.	b) None. The $PPCO_2$ Outlet readings are available.	b) (1) Crew checks the switches and circuit breakers of associated equipment which could cause the anomaly. (2) Crew attempts to reset the "DISPLAY CONVERTERS OUTPUT - 24V" circuit breaker. (3) Crew informs ground of the anomaly.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DISPLAY CONVERTER OUTPUT +24V" (3-78) (52-79721-322) (3.9 amps) 3.5.22	M	a) Opens before normal break current is exceeded.	a) Loss of +24 VDC display power for the following sensors: o Mole Sieve A and B Inlet temperature sensors for panel indicators. o Mole Sieve A and B Cond. Heat Exchange air outlet temp. sensors for panel indicators. o Mole Sieve A and B Inlet $PPCO_2$ sensors for panel indicators and TM. o Condensate Dump Primary and Secondary Vent temp sensors for panel indicators. o Fwd. Compt. Condensate Tank Diff. Pressure sensor for panel indicators and TM. o N_2 and O_2 Bottle Temp sensors for panel indicators.	a) The following panel indicators assume the no power (rest) position: o The "$PPCO_2$ IN" and "HT EXCH" indicators (located on Panel 203). o The O_2/N_2 bottle temperature indicators (located on Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on Panel 216).	a) No power readings for the following parameters: o Mole Sieve A and B PCO_2 Inlet (D209 and D213). o H_2O Condensate Tank - Diff. Press (D208).	a) N/A	- - -
		b) Internal defect, coil short to ground.	b) None. Mission essential parameters are not affected.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew attempts to reset the "DISPLAY CONVERTER OUTPUT +24V" circuit breaker. (3) Crew informs the ground of the anomaly.	b) Ground coordinates with the crew to determine what operating procedures are necessary in order to continue the mission.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker, Magnetic, "DISPLAY CONVERTER OUTPUT +5V" (3-80) (52-79721-322) (3.9 amps) (3-78) (3.5.23	M	a) Opens before normal break current is exceeded.	a) (1) Loss of +5 VDC display power to the following panel indicator sensors: o 120 PSI O_2 Regulator output pressure. o 150 PSI N_2 Regulator output pressure. o N_2 and O_2 Bottle pressures. o Aft. Compt. Diff. pressure. o Fwd. Compt. Diff. pressure. o Lock Compt. Diff. pressure. (2) The power for the TM output of these sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None	a) N/A	- - -
		b) Internal defect, coil short to ground.	b) None. Essential pressures are available on TM.	b) (1) Crew check the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew attempts to reset the "DISPLAY CONVERTER OUTPUT +5 V" circuit breaker. (3) Crew informs the ground of the anomaly.	b) Ground coordinates with the crew to determine what operating procedures are necessary in order to continue the mission.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Switch, Momentary, "VOICE" (Located on Panel 316) (52-79705-137) 3.5.24	M	a) Contact set (2, 1) fails open in the "OFF" position.	a) Power is not removed from the following equipment when the "VOICE" switch is cycled to the "OFF" position: o MDA Signal Conditioner. o CWS-1 and -2 Signal Conditioners. o The PCM Bus Converter (normally Conv. #1) o The Prime Data Recorder (normally T/R #1). Recorder continues to operate in the record mode. Recorder is not damaged if the end-of-tape is reached.	a) The "RECORD" lights (green) in the MDA, STS, Lock Compt., and CWS do not extinguish when the "VOICE" switch on Panel 316 is cycled to the "OFF" position.	a) If R/T TM is being received, the Tape Motion Monitor channel (normally K508) indicates "motion" for the Prime Data Recorder even though the Recorder is supposed to be powered-down.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Power can be removed from the above equipment by using the Voice Record switch on any of the SIA's to the "OFF" position.	b) Crew switches the Voice Record switch on any SIA to the "OFF" position.	b) Ground communicates with the crew to determine if they are recording voice.	b) IIIb	
		a) Contact set (5, 4) fails open in the "OFF" position.	a) None. Redundancy is provided by contact set (2, 1) and relay K3-370.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
		a) Contact set (2, 3) fails open in the "RECORD" position.	a) None. Redundancy is provided by contact set (5, 6).	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
		a) Contact set (5, 6) fails open in the "RECORD" position.	a) None. Redundancy is provided by contact set (2, 3).	a) None.	a) None.	a) N/A	- - -
		b) Insulating film contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Record #1 Relay #1 (K3-200) (52-79703-53) 3.5.25 This relay is used in conjunction with recording voice on the Data Recdr.	M	a) Pole B fails open in the latch position.	a) The Voice Lights Power Relay #1 (K3-279) does not cycle to the latch position when the crew switches one of the voice record switches to the "RECORD" position, thus power is not supplied to the MDA, AM and OWS Voice "RECORD" lights (green).	a) The Voice "RECORD" lights (green) located in the MDA, AM and OWS do not come on when the crew switches one of the voice record switches to the "RECORD" position.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. Loss of Voice Record lights is considered to be a nuisance.	b) (1) Crew checks the switches and circuit breakers for associated equipment, which could cause the observed anomaly. (2) Crew switches the "DATA" record switch (located on Panel 204) to the "RECORD" position. The "DATA RECORD" light (green) on Panel 204 comes on indicating tape motion in the Data Recorder. This indicates there may be a problem with the voice record control circuit. (3) Crew informs the ground of the anomaly.	b) (1) Ground verifies that the Tape Motion Monitor [illegible] (K509, K509 or K510) for the applicable Recdr indicates there is tape motion. (2) Ground informs crew prior to Data Recorder Fast Forwards or DCS commanded Data Recorder dumps. Crew must know this so they know when they cannot record voice on the data recorder.	b) [illegible]	
	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a)(1) If data is not being recorded, power is not applied to the PCM Bus (normally Bus A) when the crew switches a MDA or OWS voice record switch to the "RECORD" position. This results in a loss of power to the Data Recdr.	a) The voice "RECORD" lights (green) do not light up.	a) When data is not being recorded, delayed voice is received only from the STS and Lock Compartment stations.	a) N/A	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Record #1 Relay #1" (K3-200) (52-79703-53) (Continued)	M	b) Insulating film on contacts due to contamination	b) None. Voice recording capability on the Data Redr is affected only if Prime Data is not being recorded. Voice recording from the STS and Lock Compartment is not affected.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly. (3) Crew positions the "DATA" switch (located on Panel 204) in the "RECORD" position.	b)(1) Ground informs crew of possible missing recorded voice.	b) IIIb	
	M	a) Pole D fails open in the latch position.	a) If data is not being recorded, power is not applied to the Data Recorder (normally T/R #1) when the crew switches a MDA or OWS voice record switch to the "RECORD" position.	a) The voice "RECORD" lights (green) do not light up.	a) When data is not being recorded, voice is received only from the STS and Lock Compartment stations.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. Voice recording capability on the Data Redr. is affected only if Prime Data is not being recorded. Data Recorder can be operated continuously.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly. (3) Crew positions the "DATA" switch (located on Panel 204) in the "RECORD" position.	b)(1) Ground informs crew of possible missing recorded voice.	b) IIIb	
	M	a) Pole E fails open in the latch position.	a) If the Data Redr is not recording data, power is not supplied to the MDA, OWS-1 and OWS-2 Signal Conditioners when a MDA or OWS voice record switch is positioned in the "RECORD" position.	a) None.	a) When the Data Redr is dumped, data is not received from the MDA and OWS Signal Conditioners.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. If recorded data from affected signal conditioners is desired, crew can perform switching which is necessary to restore power to the MDA and OWS Signal Conditioners.	b) (1) Crew follows revised voice record procedure as received from the ground.	b)(1) Ground informs crew of observed anomaly. (2) Ground requests that crew use the voice record switches on the STS SIA or on Panel 316 if recorded data from the MDA and OWS may be of importance.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Record #1 Relay #1" (K3-200) (52-79703-53) (Continued)	M S	a) Pole E fails open in the reset position.	a) Power is not removed from the MDA and CWS-1 and -2 Signal Conditioners when the PCM System and Data Recorder are powered down.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption. Equipment is not damaged by the continuous application of power.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole F fails open in the reset or latch position.	a) None. Pole F is a spare.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M S	a) Pole B fails open in the reset position.	a) If the Data Rcdr is recording data, power is not removed from the voice "RECORD" lights (green) when the voice record switch is positioned in the "OFF" position. Power to the lights will be removed when tape motion ceases.	a) The voice "RECORD" lights do not extinguish when the voice record switch is positioned in the "OFF" position. When Data Rcdr is powered-down, the voice "RECORD" lights are extinguished.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) Crew informs ground of the anomaly.	b) None.	b) IIIb	
	M S	a) Pole C fails open in the reset position.	a) Power is not removed from the PCM Bus Conv. (normally Conv. #1) when PCM Bus power is not needed, i.e., when the PCM System and Data Recorder are commanded to the powered-down condition. This results in continuous application of power to the PCM Programmer and Interface Box. Power is removed from the Data Rcdr.	a) None. The voice "RECORD" lights extinguish as expected when all the MDA/AM/OWS voice record switches are all positioned in the "OFF" position.	a)(1) The temperature of the PCM Conv. (normally Conv. #1) is higher than expected after periods when the Conv. is supposedly powered-down.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Equipment is not damaged by the continuous application of power.	b) None.	b)(1) Ground may switch to an alternate Conv. for PCM Bus power. Same condition can then be observed for the new PCM Bus Conv.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Record #1 Relay #1" (K3-200) (52-79703-53) (Continued)	M S	a) Pole D fails open in the reset position.	a) Relays K3-342 and K3-343 do not cycle to the reset position when the MDA/AM/OWS voice record switches are all in the "OFF" position. Therefore, power is applied to the Data Recorder whenever the PCM Bus is powered-up.	a)(1) If end-of-tape is reached, the Data Rcdr "STOP" light (located on Panel 204) will come ON.	a)(1) The Tape Motion Monitor channel for the Data Rcdr indicates there is tape motion even though the Data Rcdr is thought to be powered-down. If end-of-tape is reached, Tape Motion Monitor channel indicates tape motion has ceased.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Rcdr is not damaged when end-of-tape is reached, Power can be removed by manual switching. Crew can manually control the recording and dumping of recorded data and voice.	b)(1) Crew checks those switches and circuit breakers of associated equipment which could cause the failure. (2) Crew informs ground of the anomaly. Ground verifies that they have not been using the Data Rcdr. (3) On instruction from the ground, crew manually switches the Data Rcdr OFF.	b)(1) Ground notifies crew of anomaly. Crew verifies they have not been using the Data Rcdr. (2) Ground requests that the crew manually switch the Data Rcdr. OFF.	b) IIIb	
	M	a) Latch coil fails open.	a) If the Data Rcdr (normally T/R #1) is not recording data, power is not supplied to the following equipment when a MDA or OWS voice record switch is switched to the "RECORD" position: o PCM Conv. (normally Conv. #1) o Data Recorder. o MDA and OWS Signal Conditioners.	a) The voice "RECORD" lights (green) do not come on.	a)(1) When data is not being recorded, delayed voice is received only from the STS and Lock stations.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Voice recording capability on the Data Rcdr. is affected only if Prime Data is not being recorded. Voice recording from the STS and Lock Compartment is not affected.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew switches the STS or Lock Compartment voice record switch to the "RECORD" position. "RECORD" lights come ON. (3) Crew informs ground of observed anomaly.	b)(1) Ground informs crew that amount of recorded voice received is less than might be expected. (2) Ground informs crew that voice recording must be controlled from the STS or Lock Compartment voice record switches when the Data Recorder is not simultaneously recording Prime Data.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Record #1 Relay #1" (K3-200) (52-79703-53) (Continued)	M	a) Reset coil fails open.	a) When Prime Data Record ON commands are not in effect and voice record "OFF" is manually commanded, power is not removed from the following equipment: o PCM Conv. (normally Conv. #1) o Data Recorder o MDA and OWS Signal Conditioners.	a) The voice "RECORD" lights (green) are not extinguished when all of the voice record switches are in the "OFF" position. Voice "RECORD" lights will extinguish if the end-of-tape is reached.	a)(1) Unexpected voice is received when voice is dumped. (2) Recorded Prime Data is received for time periods when Data Rcdr was supposed to have been powered-down. (3) If R/T TM is ON, Data Rcdr Tape Motion Monitor channel indicates there is tape motion prior to end-of-tape.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None other than excessive power consumption. Equipment is not damaged by the continuous application of power. Crew can manually remove power from the Data Rcdr.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the observed anomaly.	b)(1) Ground informs crew of the observed anomaly. (2) Ground requests that the crew manually switch the Data Rcdr. "OFF" if power removal is necessary.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Record #2 Relay #1" (K3-201) (52-79703-53) 3.5.26	M	a) Pole B fails open in the latch position.	a) None. Redundancy is provided on Pole B of Relay K3-200.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
This relay is used in conjunction with recording voice on the Data Rcdr.	M	a) Pole B fails open in the reset position.	a) If the Data Rcdr is recording data, power is not removed from the voice "RECORD" lights (green) when the voice record switch is switched to the "OFF" position. Power to the lights will be removed when tape motion ceases.	a) The voice "RECORD" lights do not extinguish when the voice record switch is positioned in the "OFF" position. When the Data Rcdr is powered-down the voice "RECORD" lights are extinguished.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) Crew informs ground of the anomaly.	b) None	b) IIIb	
	M	a) Pole C or Pole D or Pole E fails open in the latch position.	a) None. Redundancy is provided by Relay K3-201.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole F fails open in the reset or latch position.	a) None. Pole F is a spare.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW c) INDICATION d) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Record #2 Relay #1" (KJ-201) (52-79703-53) (Continued)	M S	a) Pole C fails open in the reset position.	a) Power is not removed from the PCM Bus Conv (normally Conv #1) when PCM Bus power is not needed, i.e., when the PCM System and Data Recorder are commanded to the powered-down condition. This results in continuous application of power to the PCM Programmer and Interface Box. Power is removed from the Data Redr.	a) None. The voice "RECORD" lights extinguish as expected when the MDA/AM/OWS voice record switches are all positioned in the "OFF" position.	a)(1) The temperature of the PCM Conv (normally Conv #1) is higher than expected after periods when the Conv is supposedly powered-down.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. Equipment is not damaged by the continuous application of power.	b) None	b)(1) Ground may switch to an alternate Conv for PCM Bus power. Same condition can then be observed for the new PCM Bus Conv.	b) IIIb	
	M S	a) Pole D fails open in the reset position.	a) Power is not removed from the Data Redr when commands requiring Data Redr usage have been removed unless the PCM Bus (normally Bus A) is powered-down.	a) If end-of-tape is reached, the Data Redr "STOP" light (located on Panel 204) will come ON.	a) The Tape Motion Monitor channel for the Data Redr indicates there is tape motion even though the Data Redr is thought to be powered-down. If end-of-tape is reached, Tape Motion Monitor channel indicates tape motion has ceased	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. Redr is not damaged when end-of-tape is reached. Power can be removed by manual switching. Crew can manually control the recording and dumping of recorded data and voice.	b)(1) Crew checks the switches and circuit breakers of associated equipment which could cause the failure. (2) Crew informs ground of the anomaly. Ground verifies that they have not been using the Data Redr. (3) On instruction from the ground, crew manually switches the Data Redr OFF.	b)(1) Ground notifies crew of anomaly. Crew verifies they have not been using the Data Redr. (2) Ground requests that the crew manually switch the Data Redr OFF.	b) IIIb	
	M S	a) Pole E fails open in the reset position.	a) Power is not removed from the MDA and OWS -1 and -2 Signal Conditioners when the PCM System and Data Recorder are powered down.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None, other than excessive power consumption. Equipment is not damaged by the continuous application of power.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Record #2 Relay #1" (K3-201) (52-79703-53) (Continued)	M	a) Reset coil fails open.	a) When Prime Data Record ON commands are not in effect and voice record "OFF" is manually commanded, power is not removed from the following equipment: o PCM Conv (normally Conv #1) o Data Recorder o MDA and OWS Signal Conditioners.	a) The voice "RECORD" lights (green) are not extinguished when all of the voice record switches are in the "OFF" position. Voice "RECORD" lights will extinguish if end-of-tape is reached.	a) (1) Unexpected voice is received when voice is dumped. (2) Recorded Prime Data is received for time periods when the Data Rcdr was supposed to have been powered-down. (3) If R/T TM is ON, Data Rcdr Tape Motion Monitor channel indicates there is tape motion prior to end-of-tape.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b)(1) None, other than excessive power consumption. Equipment is not damaged by the continuous application of power. Crew can manually remove power from the Data Rcdr. (2) It may be desirable that the Rcdr be used only during the later phases of storage periods.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the observed anomaly.	b)(1) Ground informs crew of the observed anomaly. (2) Ground requests that the crew manually switch the Data Recorder "OFF", if power removal is necessary.	b) IIIb	
	M	a) Latch coil fails open.	a) None. Redundancy is provided by Relay K3-200.	a) None.	a) None.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Normal "Voice Record #1 Relay #3" (K3-370) (62-79703-1) 3.5.27	M	a)(1) Coil fails open or (2) Pole A fails open when coil is energized.	a) Voice record ON commands cannot be removed by placing the MDA/CWS SIA "RECORD" switch(es) in the "OFF" position.	a) Voice "RECORD" lights (green) do not go out when crew attempts to turn OFF the voice record function from the MDA or CWS.	a) Ground observes extraneous recorded voice when voice is dumped if crew did not take immediate action when the voice "RECORD" lights did not extinguish.	a) N/A	- - -
		b)(1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) None. Voice record OFF command can be executed from the STS or Lock Compartment voice record switches.	b)(1) Crew places the STS SIA or Lock Compartment Instrument Panel (Panel 316) voice record switch to the "OFF" position.	b)(1) Ground informs crew of observed anomaly. (2) Ground requests that the crew check the voice record switches.	b) IIIb	
	M	a) Pole B fails open when the coil is energized.	a) None - Pole B is a spare.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Recorder Motion Monitor Relay #1" (KJ-283) (52-79703-61) 3.5.28 This relay is used in conjunction with panel indicator light monitoring of Data Rcdr tape motion.	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None	b) None	b) IIIb	
		a) Pole C fails open in the reset position.	a) When Prime Data Record ON commands are not in effect and voice record is manually commanded "OFF", power is not removed from the voice "RECORD" lights.	a) The voice "RECORD" lights do not extinguish when the voice record function is manually commanded "OFF".	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) None.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) Power is not applied to the voice "RECORD" lights when the crew commands voice record "ON".	a) Voice "RECORD" lights do not light up when the crew records voice.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Voice recording is not affected by loss of power to the voice "RECORD" lights.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the observed anomaly.	b)(1) After voice dump has been completed, ground informs crew that recorded voice has been received.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) None. Pole D is not functional in the reset position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Recorder Motion Monitor Relay #1" (K3-283) (52-79703-61) (Continued)	M	a) Pole D fails open in the latch position.	a) When the crew manually records Prime Data, power is not supplied to the "DATA RECORD" light on Panel 204.	a) The "DATA RECORD" light (green) does not light up.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. Loss of power to the "DATA RECORD" light does not affect the recording of Prime Data. The recording of Prime Data is normally controlled by the ground.	b)(1) Crew switches the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew switches the STS SIA voice record switch to the "RECORD" position. The voice "RECORD" light (green) comes ON. This indicates that the Data Recorder has tape motion. (3) Crew informs ground of the anomaly.	b) When Prime Data is dumped, ground determines that Prime Data was being recorded prior to time that crew switched voice record switch to the "RECORD" position.	b) IIIb	
	M	a) Pole E or Pole F fails open in the reset or latch position.	a) None, these poles are spares.	a) None.	a) None.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	
	M	a)(1) Latch coil fails open, or (2) Pole B fails open in the reset position.	a) When the crew manually commands "DATA RECORD" or voice "RECORD", power is not supplied to the respective panel indicator lights.	a)(1) When crew switches the "TAPE RECORDING DATA" switch (located on Panel 204) to the "RECORD" position, the "DATA RECORD" light (green) does not come ON. (2) When the crew switches one of the voice record switches to the "RECORD" position, the voice "RECORD" lights (green) do not come ON.	a) Recorded Data or Recorded Data and Voice are received for the time period during which the anomaly was noted.	a) N/A	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Recorder Motion Monitor Relay #1" (KJ-283) (52-79703-61) (Continued)		b)(1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) None. Loss of power to the "DATA RECORD" and voice "RECORD" lights does not affect recording capability.	b)(1) Crew uses the "LIGHTING STATUS" test switch (located on Panel 207) to test the "DATA RECORD" light. (2) Crew informs ground of anomaly.	b) Ground informs crew that Data Rcdr appeared to be functioning normally during the time period in which the anomaly was noted.	b) IIIa	
		a)(1) Reset coil fails open, or (2) Pole B fails open in the latch position.	a) None, unless there is a loss Data Rcdr tape motion. Then there is a false indication of tape Motion on Data & Voice "RECORD" indicatior lights.	a) None.	a) None.	a) N/A	- - -
		b)(1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release "Data Recorder Motion Monitor Relay #2" (K3-284) (52-79715-13) 3.5.29	M	a)(1) Pole A fails open when coil is energized, or (2) Coil fails open with Relay K3-283 in the reset position.	a) (1) K3-283 cannot be cycled to the latch position, thus, when the crew manually commands "DATA RECORD" or voice "RECORD", power is not supplied to the respective panel indicator lights.	a)(1) When crew switches the "TAPE RECORDING DATA" switch (located on Panel 204) to the "RECORD" position, the "DATA RECORD" light (green) does not come ON. (2) When the crew switches one of the voice record switches to the "RECORD" position, the voice "RECORD" lights (green) do not come ON.	a) Recorded Data or Recorded Data and Voice is received for the time period during which the anomaly was noted.	a) N/A	
This relay is used in conjunction with panel indicator light monitoring of Data Rcdr tape motion.		b)(1) Defective wire or terminal due to mechanical or thermal stress, (2) Insulating film on contacts due to contamination.	b) None. Loss of power to the "DATA RECORD" and voice "RECORD" lights does not affect recording capability.	b)(1) Crew uses the "LIGHTING STATUS" test switch (located on Panel 207) to test the "DATA RECORD" light. (2) Crew informs ground of anomaly.	b) Ground informs crew that Data Rcdr appeared to be functioning normally during the time period in which the anomaly was noted.	b) IIIb	
		a)(1) Pole B fails open when coil is energized, or (2) Coil fails open with Relay K3-283 in the latch position.	a) Relay K3-283 cannot be cycled to the reset position. There is no other effect on the system.	a) None.	a) None.	a) N/A	
		b)(1) Defective wire or terminal due to mechanical or thermal stress. (2) Insulating film on contacts due to mechanical or thermal stress.	b) None	b) None.	b) None.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Lights Power Relay #1" (K3-279) (52-79703-45) 3.5.30	M	a)(1) Pole C fails open in the latch position, or Pole B fails open in the reset position.	a) Power is not supplied to the MDA/AM/OWS voice "RECORD" lights (green) when the crew switches any of the voice record switches to the "RECORD" position.	a) The voice "RECORD" lights do not come ON when the crew switches one of the voice record switches to the "RECORD" position.	a) Recorded data and Voice are received for the time period during which the anomaly was noted.		
		b) Insulating film on contacts due to contamination.	b) None. Loss of power to the voice "RECORD" lights does not affect recording capability.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the failure. (2) Crew informs ground of the anomaly.	b) Ground informs crew that the Data Rcdr appears to have been functioning normally during the time period in which the anomaly was noted.		
This relay is used for controlling power to the "TAPE RECORDING DATA LIGHT".	M	a) Pole C fails open in the reset position.	a) None - Pole C is not functional in the reset position.	a) None.	a) None.		
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.		
	M	a)(1) Pole B fails open in the latch position, or (2) Reset coil fails open.	a) Power is not removed from the MDA/AM/OWS voice "RECORD" lights (green) when the crew switches the all voice "RECORD" switches to the "OFF" position.	a) The voice "RECORD" lights do not extinguish when all of the voice "RECORD" switches are in the "OFF" position.	a) If Prime Data is not being recorded, the T/R #1 Tape Motion Monitor channel (K508) indicates there is no tape motion.		
		b)(1) Insulating film on contacts due to contamination, or (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Improper operation of the voice "RECORD" lights does not affect recording capability.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b)(1) Ground informs crew that TM indicates the Data Rcdr turned OFF as commanded. (2) Ground requests that the crew manually switch the Data Rcdr "OFF" to determine whether the light will turn OFF (light does not turn OFF).		

*COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Lights Power Relay #1" (K3-279) (52-79703-45) (Continued)	M	a) Latch coil fails open.	a) Power is not supplied to the MDA/AM/OWS voice "RECORD" lights (green) when the crew switches any of the voice record switches to the "RECORD" position.	a) The voice "RECORD" lights do not come ON when the crew switches one of the voice record switches to the "RECORD" position.	a) Recorded Data and Voice are received for the time period during which the anomaly was noted.		
		b) Insulating film on contacts due to contamination.	b) None. Loss of power to the voice "RECORD" lights does not affect recording capability.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the failure. (2) Crew informs ground of the anomaly.	b) Ground informs crew that the Data Rcdr appears to have been functioning normally during the time period in which the anomaly was noted.		
	M	a) Pole D fails open in the reset or latch position.	a) None - Pole D is a spare.	a) None.	a) None.		
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.		
	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None.	a) None.		
		b) Insulating film on contacts due to contamination.	b) None.	b) None.	b) None.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Voice Lights Power Relay #2" (K3-280) (52-79715-13) 3.5.31	M	a) (1) Pole A fails open when coil is energized, or (2) Coil fails open with Relay K3-279 in the reset position.	a) Power is not supplied to the MDA/AM/CWS voice "RECORD" lights (green) when the crew switches any of the voice record switches to the "RECORD" position.	a) The voice "RECORD" lights do not come ON when the crew switches one of the voice record switches to the "RECORD" position.	a) Recorded data and voice is received for the time period during which the anomaly was noted.	a) N/A	
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Loss of power to the voice "RECORD" lights does not affect recording capability.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the failure. (2) Crew informs ground of the anomaly.	b) Ground informs crew that the Data Rcdr appears to have been functioning normally during the time period in which the anomaly was noted.	b) IIIb	
This relay is used for controlling power to the "TAPE RECORDING DATA LIGHT".	M	a) (1) Pole B fails open when coil is energized, or (2) Coil fails open with Relay K3-279 in the latch position.	a) Power is not removed from the MDA/AM/CWS voice "RECORD" lights (green) when the crew switches the all voice "RECORD" switches to the "OFF" position.	a) The voice "RECORD" lights do not extinguish when all of the voice "RECORD" switches are in the "OFF" position.	a) If Prime Data is not being recorded, the T/R #1 Tape Motion Monitor channel (K508) indicates there is no tape motion.	a) N/A	
		b) (1) Insulating film on contacts due to contamination, or (2) Defective wire or terminal due to mechanical or thermal stress.	b) None. Improper operation of the voice "RECORD" lights does not affect recording capability.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly.	b) (1) Ground informs crew that TM indicates the Data Rcdr turned OFF as commanded. (2) Ground requests that the crew manually switch the Data Rcdr "OFF" to determine whether the light will turn OFF (light does not turn OFF).	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Primary Display Converter, 61C880052 3.5.32A	M	a) Loss of +5 VDC output power.	a)(1) There is a loss of +5 VDC display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-down. (2) Power to the Caution and Warning Sensors is not affected.	a) The following panel indicators assume the no power (rest) position: o The O_2/N_2 bottle pressure, the O_2/N_2 pressure (200/225 PSI) and the "FWD", "LOCK" and "AFT" indicators (located on Panel 225). o The "LOCK", "AFT" and "O_2" pressure indicators (located on Panel 316).	a) None	b) N/A	
		b) Defective component due to mechanical or thermal stress.	b)(1) None. The +5 VDC display power is restored to the panel indicator sensors when the PCM Bus is powered-up. (2) Crew can switch to the Secondary Display Converter.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly. Crew switches to the Secondary Display Conv.	b) None	b) IIIb	
	M	a) Loss of -24 VDC output power.	a)(1) There is a loss of -24 VDC display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered down. (2) Power to the Caution and Warning Sensors is not affected.	a) Questionable readings on the "$PPCO_2$ IN" indicator (located on Panel 203).	a) None	a) N/A	
		b) Defective component due to mechanical or thermal stress.	b)(1) None. The -24 VDC display power is restored to the panel indicator sensors when the PCM Bus is powered-up. (2) Crew can switch to the Secondary Display Converter.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly. Crew switches to the Secondary Display Converter.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Primary Display Converter, 61C880052 (Continued)	M	a) Loss of -24 VDC output power.	a)(1) There is a loss of +24 VDC display power to the panel indicator sensors when the PCM Bus (normally Bus A) is powered-down.	a) The following panel indicators assume the no power (rest) position: o The "PPCC$_2$ IN" and "HT EXCH" indicators (located on Panel 203). o The O_2/N_2 bottle temperature indicators (located on Panel 225). o The "TANK ΔP" and "VENT TEMP" indicators (located on Panel 216).	a) None	a) N/A	- - -
		b) Defective component due to mechanical or thermal stress.	b)(1) None. The +24 VDC display power is restored to the panel indicator sensors when the PCM Bus is powered-up. (2) Crew can switch to the Secondary Display Converter.	b)(1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the anomaly. Crew switches to the Secondary Display Converter.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "QCM Contamination Monitor Relay" (K3-381) (52-79703-45 3.5.33	L M S	a) Pole D fails open in the reset or latch position.	a) None - This pole is a spare.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C or Pole B fails open in the latch position.	a) None - These poles are redundant to each other.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) Power is not supplied to the QCM Contamination Monitor when the QCM Contamination Monitor ENABLE command (S408) is given.	a) None	a) Ground observes a loss of data from each of the four QCM's.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) Loss of data from the QCM's.	b) None	b) Ground requests that the crew check the "QCM MON" circuit breaker on Panel 200.	b) IIIb	
	L M S	a) Reset coil fails open.	a) Power is not removed from the QCM Contamination Monitor OFF command (S409) is given.	a) None	a) Ground observes that QCM data is received after the OFF command has been given.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) When ground wants power removed from the QCM's, they request that the crew switch the "QCM MON" circuit breaker (on Panel 200) to the open position.	b) IIIb	

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "QCM Contamination Monitor Relay" (K3-381) (52-79703-45) (Continued)	L M S	a) Pole C or Pole B fails open in the reset position.	a) None - Not functional	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only	b) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
Circuit Breaker, Magnetic, "QCM MON" (on Panel 200) (3-125) (52-79721-322) (3.9 amps)	L M S	a) Opens before normal break current is exceeded.	a) Loss of power to the QCM Contamination Monitors.	a) The bat handle of the "QCM MON" circuit breaker is in the open position.	a) Ground observes a loss of data from each of the four QCM's.	a) N/A	---
		b) Mechanical or thermal stress.	b) Loss of data from the QCM's.	b) (1) Crew attempts to reset the circuit breaker. (2) Crew informs the ground of the anomaly.	b) Ground requests that the crew check the "QCM MON" circuit breaker.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Circuit Breaker Magnetic "RECORDER LIGHT" (3-98) (52-79721-322) (Located on Panel 200) 3.5.35	M	a) Opens before normal break current is exceeded.	a) Loss of power to the Record Lights (green) located on the Speaker Intercom Assemblies.	a) Record light does not come on when crewman cycles one of the Speaker Intercom record switches to the "RECORD" position.	a) None	a) N/A	---
		b) Internal defect, coil short to ground.	b) None, other then a loss of light indication that the Voice Record Relays are in the "RECORD" position.	b) (1) Crewman recycles the record switch. (2) Crewman requests that one of the other crewman check the record light on another Intercom Panel. (3) Crew attempts to reset the "RECORDER LIGHT" circuit breaker.	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Voice Record#1 Relay #2" (K3-198) (52-79703-61) 3.5.04	M	a) Pole F (or Pole E or Pole D) fails open in the latch position.	a) There is a loss of the voice input signal to Rcdr 1 (or Rcdr 2 or Rcdr 3)when the crew attempts to record voice from one of the OWS of MDA stations.	a) None	a) Voice recorded from the OWS and MDA stations is not received from the affected Rcdr.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None. Two different Rcdr slots can still be used for recording voice from the OWS and MDA station.	b) None	b) (1) Ground informs crew of the anomaly. (2) Ground configures the Rcdrs so that the affected Rcdr is the Exp 2 Rcdr or requests that the crew manually do the same.	b) IIIb	
	M	a) Latch coil fails open.	a) Crew cannot record voice by using the Voice Record switches in the OWS or MDA.	a) None	a) Ground does not receive recorded voice from the OWS and MDA stations.	a) N/A	---
		b) Defective wire or therminal due to mechanical or thermal stress.	b) None. Crew can uses the AM or Lock Voice Record switches when they wish to record voice from an MDA or OWS station.	b) None	b) (1) Ground informs crew of the anomaly. (2) Ground requests that the crew use the AM or Lock Voice Record switches when they record voice from an MDA or OWS station.	b) IIIb	
	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	a) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Voice Record #1 Relay #2" (K3-198) (52-79703-61)	M	a) Reset coil fails open.	a) The Channel B input to the Rcdrs is not disconnected from Audio Load Compensator A or B. There is no other effect on the system.	a) None	a) None	a) N/A	---
(Continued)		b) Defective wire or therminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole F or Pole E or Pole D fails open in the reset position.	a) None - These poles are not functional in the reset position.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M	a) Pole B or Pole C fails open in the reset or latch position.	a) None - These poles are spares.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

DATE 10 July 1970
REVISED 31 August 1971
REVISED

SYSTEM: INSTRUMENTATION
SUBSYSTEM: PROGRAMMER CONTROL

MCDONNELL
ST. LOUIS, MISSOURI

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
PCM Programmer, Primary (52-85713-893) 3.6.1A	L M S	a) Loss of R/T TM output.	a) Loss of R/T TM data. Delayed time data is not affected.	a) None	a) Loss of R/T TM data. Delayed time data is not affected.	a) N/A	----
		b) Component failure due to mechanical or thermal stress.	b) Temporary loss of data. A Secondary Programmer is available in inactive standby.	b) None	b) (1) Ground switches to the Secondary Pgmr, or (2) Ground requests that the crew switch to the Secondary Pgmr.	b) IIIb	
	L M S	a) Loss of TR Data - PSF (+) output.	a) Loss of subframe 1 delayed time data. R/T TM data is not affected.	a) None	a) Loss of subframe 1 delayed time data. R/T TM data is not affected.	a) N/A	----
		b) Component failure due to mechanical or thermal stress.	b) Temporary loss of data. A Secondary Pgmr is available in inactive standby.	b) None	b) (1) Ground switches to the Secondary Pgmr, or (2) Ground requests that the crew switch to the Secondary Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #1 (KJ-130) (52-79703-61) 3.6.4 This relay is used for DCS selection of the Primary or Secondary PCM Programmer	L M S	a) Reset coil fails open.	a) Ground cannot select the Primary Programmer.	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Relay will be in the reset position (Primary Programmer) at lift-off and will remain in this position for a normal mission.	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) In the event of a failure which requires switching to the Secondary Programmer, if ground commands the switch, there will be a loss of all Interface Box Data, all High Level Multiplexer data and all Low Level Multiplexer data.	a) None	a) Ground observes loss of all Interface Box data, all High Level Multiplexer data, and all Low Level Multiplexer data.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b)(1) Crew can manually select desired Programmer. (2) In the event the failures occur during an unmanned phase, crew visitation may be precluded due to large amount of missing data.	b) None	b) Ground requests that the crew switch to the desired Programmer.	b) N/A - Double Failure.	
	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	---
	L M S	a) Pole B fails open in the reset position.	a) Loss of RZ Timing from the Primary Programmer to the Interface Box. Results in loss of RZ conversion of delayed time subframe data and consequent loss of delayed time subframe data.	a) None	a) Ground observes loss of delayed time SF data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of data. (2) Ground can select Secondary Programmer. (3) Crew can manually select Primary or Secondary Programmer.	b) None	b)(1) Ground switches to the Secondary Programmer, or (2) Ground requests that crew switch to the desired Programmer.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #1 (K-130) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) Loss of 3/4 Word from the Primary Programmer to the Interface Box.	a) None	a) Ground observes loss of all analog data from the Interface Box and High Level Multiplexers.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of analog data from the Interface Box and High Level Multiplexers. (2) Ground can select Secondary Programmer, or (3) Crew can manually select Primary or Secondary Programmer.	b) None	b)(1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Loss of Timing Reset from the Primary Programmer to the Interface Box.	a) None	a) Ground observes loss of synchronization of all Interface Box and Multiplexer data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of synchronization of Interface Box and Multiplexer data. (2) Ground can select Secondary Programmer, or (3) Crew can manually select Primary or Secondary Programmer.	b) None	b)(1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Loss of 5.12 KB Clock from the Primary Programmer to the Interface Box.	a) None	a) Ground observes loss of delayed time data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of delayed time data. (2) Ground can select Secondary Programmer. (3) Crew can manually select Primary or Secondary Programmer.	b) None	b) (1) Ground switches to the Secondary Programmer, or (2) Ground requests that crew switch to the desired Programmer.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #1" (K-130) (52079703-61) (Continued)	L M S	a) Pole F fails open in the reset position.	a) Loss of Timing Drive from the Primary Programmer to the Interface Box.	a) None	a) Ground observes loss of all High Level and Low Level Multiplexer data and all Interface Box data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of all High Level and Low Level Multiplexer data and all Interface Box data. (2) Ground can select Secondary Programmer, or (3) Crew can manually select Primary or Secondary Programmer.	b) None	b)(1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	
			NOTE - Poles B, C, D, E and F failing open in the latch position are not documented. It is assumed that DCS selection of the Secondary Programmer will occur only if there is a loss of data from the Primary Programmer due to a prior failure.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #2" (K3-131) (52-79703-61) 3.6.5	L M S	a) Reset coil fails open.	a) Ground cannot select the Primary Programmer.	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Relay will be in the reset position (Primary Programmer) at lift-off and will remain in this position for a normal mission.	b) None	b) None	b) IIIb	
This relay is used for DCS selection of the Primary or Secondary PCM Programmer.	L M S	a) Latch coil fails open.	a) In the event of a failure which requires switching to the Secondary Programmer, if ground commands the switch there will be a loss of R/T TM and a loss of Subframes 1, 2, 3 and 4 delayed time data.	a) None	a) Ground observes loss of R/T TM and a loss of Subframes 1, 2, 3 and 4 delayed time data.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b)(1) Crew can manually select desired Programmer. (2) In the event the failures occur during an unmanned phase, crew visitation may be precluded.	b) None	b) Ground requests that the crew manually select the desired Programmer.	b) N/A - Double failure.	
	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	---
	L M S	a) Pole B fails open in the reset position.	a) Loss of R/T TM signal from the Primary Programmer to the R/T TM Transmitter.	a) None	a) Loss of R/T TM data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of R/T TM data. (2) Ground can select Secondary Programmer, or (3) Crew can manually select the Primary or Secondary Programmer.	b) None	b(1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #2" (K3-131) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Loss of T/R Clock from the Primary Programmer to the Tape Recorders.	a) None	a) Ground observes loss of subframe 1, 2, 3 and 4 delayed time data	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of subframe 1, 2, 3 and 4 delayed time data. (2) Ground can select the Secondary Programmer, or (3) Crew can manually select the Primary or Secondary Programmer.	b) None	b)(1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Loss of T/R Date - PSF(-) from the Primary Programmer to the Prime Data Tape Recorder.	a) None	a) Ground observes loss of subframe 1 delayed time data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of subframe 1 delayed time data. (2) Ground can select the Secondary Programmer, or (3) Crew can manually select the Primary or Secondary Programmer.	b) None	b)(1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Loss of T/R Data - PSF(+) from the Primary Programmer to the Prime Date Tape Recorder.	a) None	a) Ground observes loss of subframe 1 delayed time data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of subframe 1 delayed time data. (2) Ground can select the Secondary Programmer, or (3) Crew can manually select the Primary or Secondary Programmer.	b) None	b)(1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Programmer Select DCS Relay #4" (K3-133) (52-79703-61) 3.6.6 This relay is used for DCS selection of the Primary or Secondary PCM Programmer.	L M S	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) Loss of Bits (5,6,7) from the Primary Programmer to the Interface Box.	a) None	a) Ground observes a loss of Interface Box and Multiplexer analog data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of Interface Box and Multiplexer analog data. (2) Ground can select the Secondary Programmer, or (3) Crew can manually select the Primary or Secondary Programmer.	b) None	b) (1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Loss of Bit Rate (C3 Shift Pulses) from the Primary Programmer to the I/B.	a) None	a) Ground observes a loss of subframe 1, 2, 3 and 4 delayed time data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of delayed time subframe 1, 2, 3 and 4 data. (2) Ground can select the Secondary Programmer, or (3) Crew can manually select the Primary or Secondary Programmer.	b) None	b) (1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Loss of Bit (2,3) from the Primary Programmer to the I/B.	a) None	a) Ground observes a loss of I/B and Multiplexer analog data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of I/B and Multiplexer analog data. (2) Ground can select the Secondary Programmer, or (3) Crew can manually select the Primary or Secondary Programmer.	b) None	b) (1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew manually switch to the desired Programmer.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #4" (K3-133) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) Loss of the 12.8 KB (Word Rate) from the Primary Programmer to the I/B. This results in a loss of all I/B data.	a) None	a) Ground observes a loss of all I/B data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of I/B data. (2) Ground can select the Secondary Programmer, or (3) Crew can manually select to the Primary or Secondary Programmer.	b) None	b) (1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	
	L M S	a) Pole F fails open in the reset position.	a) Loss of TRS clock from the Primary Programmer to the I/B. This results in a loss of time in subframes 2, 3, and 4.	a) None	a) Ground observes a loss of time in subframes 2, 3, and 4.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data. (2) Ground can select the Secondary Programmer, or (3) Crew can manually select the Primary or Secondary Programmer.	b) None	b) (1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.	b) IIIb	
	L M S	a) Reset coil fails open.	a) Ground cannot select the Primary Programmer.	a) None	a) None	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Relay will be in the reset position (Pri.Pgmr.) at lift-off and will remain in this position for a normal mission.	b) None	b) None	b) IIIB	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #4" (K3-133) (52-79703-61)	L M S	a) Latch coil fails open.	a) In the event of a failure which requires switching to the Secondary Programmer, if ground commands the switch there is a loss of all I/B data and delayed time data from subframes 1, 2, 3 and 4.	a) None.	a) Ground observes a loss of all I/B data and delayed time data from subframes 1, 2, 3 and 4.	a) N/A	----
(Continued)		b) Defective wire or terminal due to mechanical or thermal stress.	b) (1) Crew can manually select the desired Programmer. (2) In the event the failures occur during an unmanned phase, crew visitation may be precluded.	b) None	b) Ground requests that the crew switch to the desired Programmer.	b) M/A - Double Failure	

NOTE - Poles B,C, D, E and F failing open in th latch position are not documented. It is assumed that) selection of the Secondary Programmer will occur only if there is a loss of data from the Primary Programmer due to a prior failure.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #5" (K3-134) (52-79703-61) 3.6.7	L M S	a) Pole A or Pole E or Pole F fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
This relay is used for DCS selection of the Primary or Secondary PCM Programmer.	L M S	a) Pole B or Pole C or Pole D fails open in the reset position.	a) Loss of Digital Data (+) or Digital Sync (+) or Digital Reg (+) circuits respectively, to the Digital Interface from the Primary Programmer.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The Digital Interface is not used.	b) None	b) None	b) IIIb	
	L M S	a) Pole B or Pole C or Pole D fails open in the latch position.	a) Loss of Digital Data (+) or Digital Sync (+) or Digital Reg (+) circuits respectively, to the Digital Interface from the Secondary Programmer.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The Digital Interface is not used.	b) None	b) None	b) IIIb	
	L M S	a) Reset foil or latch coil fails open.	a) None. This relay serves no function during the mission.	a) None	a) None	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #6" (K3-135) (52-79703-61) 3.6.8 This relay is used for DCS selection of the Primary or Secondary PCM Programmer.	L M S	a) Reset coil fails open.	a) Ground cannot select the Pri. Pgmr.	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None. Relay will be in the reset position (Pri. Pgmr.) at lift-off and will remain in this position for a nominal mission.	b) None	b) None	b) IIIb	
	L M S	a) Latch coil fails open.	a) In the event of a failure which requires switching to the Sec. Pgmr., if ground commands the switch there is a loss of Sec. Pgmr. power resulting in a loss of TM.	a) None	a) Loss of TM data.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b)(1) Crew can manually select desired Pgmr. (2) In the event the failures occur during an unmanned phase, crew visitation may be precluded.	b) None	b)(1) Ground requests that the crew switch to the desired Pgmr.	b) N/A - Double failure.	
	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	---
	L M S	a) Pole B fails open in the reset position.	a) Loss of TRS Data (+) parameter from the Electronic Timer to the Pri. Pgmr.	a) None	a) Ground observes loss of time information on TM.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Temporary loss of time information on TM data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that crew switch to the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #6" (K3-135) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Loss of the Request TR parameter from the Pri. Pgmr. to the Electronic Timer. This results in a loss of DCS reset time.	a) None	a) Ground observes loss of DCS reset time. (K503)	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of DCS reset time. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Loss of Request Elapsed Time parameter from the Pri. Pgmr. to the Electronic Timer.	a) None	a) Loss of time information on TM.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Loss of -24 VDC power to the Pri. Pgmr.	a) None	a) Loss of TM data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of TM data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #6" (K3-135) (52-79703-61) (Continued)	L M S	a) Pole F fails open in the reset position.	a) Loss of the Digital Clock (+) parameter from the Digital Interface to the Pri. Pgmr.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None, The Digital Interface is not used.	b) None	b) None	b) IIIb	
			NOTE - Poles B, C, D, E and F failing open in the latch position are not documented. It is assumed that DCS selection of the Secondary Programmer will occur only if there is a loss of data from the Primary Programmer due to a prior failure.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #7" (K3-136) (52-79703-61) 3.6.9	L M S	a) Reset coil fails open.	a) Ground cannot select the Pri. Pgmr.	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None - Relay will be in the reset position (Pri. Pgmr.) at lift-off and will remain in this position for a nominal mission.	b) None	b) None	b) IIIb	
This relay is used for DCS selection of the Primary or Secondary PCM Programmer	L M S	a) Latch coil fails open.	a) In the event of a failure which requires switching to the Sec. Pgmr., if ground commands the switch there is a loss of the following parameters: o TRS CLK (+) from Electronic Timer to Sec. Pgmr. o H/L Data Switch from I/B to the Sec. Pgmr. o PSC Sync #1 from the I/B to the Sec. Pgmr. o PSC Sync #2 from the I/B to the Sec. Pgmr. o TRS data from Sec. Pgmr to the I/B. These losses result in a loss of the following: o Time information o MFC n5, n6, n7, n8, n9, and n10 data. o PSC Sync Word 1 for Subframes 2, 3 and 4. o PSC Sync Word 2 for Subframes 2, 3 and 4. o 24 bit parallel time word & the fine & coarse time in subframes 2, 3, & 4.	a) None	a) Ground observes a loss of the following data: o Time information o MFC n5, n6, n7, n8, n9 and n10 data. o PSC Sync Word 1 for Subframes 2, 3 and 4. o PSC Sync Word 2 for Subframes 2, 3 and 4. o 24 bit parallel time word and the fine & coarse time in subframes 2, 3, & 4.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b)(1) Crew can manually select the desired Pgmr. (2) In the event the failures occur during an unmanned phase, crew visitation may be precluded.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) N/A - Double failure.	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #7" (K3-136) (52-79703-61) (Continued)	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	---
	L M S	a) Pole B fails open in the reset position.	a) Loss of the PSC Sync #2 from the I/B to the Pri. Pgmr. This results in a loss of PSC Sync Word 2 for Subframes 2, 3 and 4.	a) None	a) Ground observes a loss of PSC Sync Word 2 for Subframes 2, 3 and 4.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Temporary loss of data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Loss of PSC Sync #1 from the I/B to the Pri. Pgmr. This results in a loss of PSC Sync Word 1 for Subframes 2, 3 and 4.	a) None	a) Ground observes a loss of PSC Sync Word 1 for Subframes 2, 3 and 4.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Temporary loss of data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Loss of the HL Data Switch parameter from the I/B to the Pri. Pgmr. This results in a loss of the MFC n5, n6, n7, n8, n9 and n10 data.	a) None	a) Ground observes a loss of MFC n5, n6, n7, n8, n9 and n10 data.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Temporary loss of data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #7" (K3-136) (52-79703-61) (Continued)	L M S	a) Pole F fails open in the reset position.	a) Loss of the TRS CLK (+) parameter from the Electronic Timer to the Pri. Pgmr. This results in a loss of time information.	a) None	a) Ground observes a loss of time information.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b)(1) Temporary loss of data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch the to desired Pgmr.	b) IIIb	
	L M S	a) Pole E fails in the reset position.	a) Loss of TRS Data from the Primary Programmer to the Interface Box.	a) None	a) Ground observes a loss of the 24 bit paralles time word and a loss of the fine and coarse time in subframes 2, 3, & 4.	a) N/A	---
		b) Insulating film	b)(1) Temporary loss of the 24 bit parallel time word and the fine and coarse time in Subframes 2, 3, and 4. (2) Ground can select the Secondary Programmer, or (3) Crew can manually select the Primary or Secondary Programmer.		b)(1) Ground switches to the Secondary Programmer, or (2) Ground requests that the crew switch to the desired Programmer.		
			NOTE: Poles B, C, D, E and F failing open in the latch position are not documented. It is assumed that DCS selection of the Secondary Programmer will occur only if there is a loss of data from the Primary Programmer due to a prior failure.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #8" (K3-118) (52-79703-61) 3.6.10	L M S	a) Reset coil fails open.	a) Ground cannot select the Sec. Pgmr.	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None - Relay will be in the reset position (Pri. Pgmr.) at lift-off and will remain in this position for a nominal mission.	b) None	b) None	b) IIIb	
This relay is used for DCS selection of the Primary or Secondary PCM Programmer.	L M S	a) Latch coil fails open.	a) In the event of a failure which requires switching to the Sec. Pgmr., if ground commands the switch there is a loss of the following parameters: o Digital Insert from the I/B to the Sec. Pgmr. o Fine Time Insert from the I/B to the Sec. Pgmr. o PSC Sync #3 from the I/B to the Sec. Pgmr. o R/T TM Hardline These losses result in a loss of the following: o All digital (coarse time in Subframes 2, 3, 4 and bilevels) data from the I/B and Multiplexers. o Fine Time in Subframes 2, 3 and 4. o PSC Sync Word 3 for Subframes 2, 3 and 4.	a) None	a) Ground observes a loss of the following: o All digital (coarse time in Subframes 2, 3, 4 and bilevels) data from the I/B and Multiplexers. o Fine Time in Subframes 2, 3 and 4. o PSC Sync Word 3 for Subframes 2, 3 and 4.	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b)(1) Crew can manually select the desired Pgmr. (2) In the event the failures occur during an unmanned phase, crew visitation may be precluded.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) N/A - Double failure.	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #3" (K3-118) (52-79703-61) (Continued)	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	---
3.6.10	L M S	a) Pole D fails open in the reset position.	a) Loss of the Digital Insert parameter from the I/B to the Pri. Pgmr. This results in a loss of all digital (coarse time in Subframes 2, 3, 4 and bilevels) data from the I/B and Multiplexers.	a) None	a) Ground observes loss of all digital (coarse time in Subframes 2, 3, 4 and bilevels) data from the I/B and Multiplexers.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Temporary loss of data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Loss of the Fine Time Insert parameter from the I/B to the Pri. Pgmr. This results in a loss of Fine Time in Subframes 2, 3 and 4.	a) None	a) Ground observes a loss of Fine Time in Subframes 2, 3 and 4.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Temporary loss of data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole B or Pole C fails open in the reset position.	a) Loss of R/T TM Hardline which is for ground test only.	a) None	a) None	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) III b	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select DCS Control Relay #8" (K3-118) (52-79703-61) (Continued)	L M S	a) Pole F fails open in the reset position.	a) Loss of the PSC Sync #3 parameter from the I/B to the Pri. Pgmr. This results in a loss of PSC Sync Word 3 for Subframes 2, 3 and 4.	a) None	a) Ground observes a loss of PSC Sync Word 3 for Subframes 2, 3 and 4.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Temporary loss of data. (2) Ground can select the Sec. Pgmr. (3) Crew can manually select the Pri. or Sec. Pgmr.	b) None	b)(1) Ground switches to the Sec. Pgmr., or (2) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
			NOTE - Poles B, C, D, E and F failing open in the latch position are not documented. It is assumed that DCS selection of the Secondary Programmer will occur only if there is a loss of data from the Primary Programmer due to a prior failure.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #1" (K3-148) (52-79703-61) 3.6.22	L M S	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in this position for a nominal mission.	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
This relay is used for Command or Manual Mode of Programmer Selection.	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	---
	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-149, -150, -152, and -153.	a) None	a) None	a) N/A	---
	L M S	a) Pole C fails open in the reset position.	a) Loss of the 5.12 KB Clock parameter from the Pgmr. to the I/B.	a) None	a) Ground observes a loss of delayed time data.	a) N/A	---
		b) Insulating film on contacts due to contamination	b) (1) Loss of delayed time data. (2) Crew can manually select the desired Pgmr. This restores lost data. (3) If failure occurs during an unmanned phase, ground cannot restore lost data.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Loss of 3/4 Word from the Pgmr to the I/B and L/L Muxes E, F & G.	a) None	a) Ground observes a loss of all analog data from the I/B and H/L Muxes.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) Loss of all analog data from the I/B and High Level Muxes. (2) Crew can manually select the desired Pgmr. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Programmer Select Mode Control Relay #1" (K3-148) (52-97903-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) (1) Loss of the Timing Reset parameter from the Pgmr. to the I/B.	a) None	a) Ground observes a loss of synchronization of all I/B and Multiplexer data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) Loss of synchronization of all I/B and Multiplexer data. (2) Crew can manually select the desired Pgmr. This restores lost data. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole F fails open in the reset position	a) Loss of the Timing Drive parameter from the Pgmr. to the I/B .	a) None	a) Ground observes a loss of all data from the I/B and Multiplexer data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) Loss of all High Level and Low Level Multiplexer data and all Interface Box Data. (2) Crew can manually select the desired Pgmr. This restores lost data. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

NOTE: This relay is cycled to the latch position for manual selection of the desired Programmer. Since Programmer selection will normally be performed via DCS commands, the latch position functions are not documented.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #2" (K3-149) (52-79703-61) 3.6.23	L M S	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in this position for a nominal mission.	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	---
	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-148, -150, -152, and -153.	a) None	a) None	a) N/A	---
	L M S	a) Pole C fails open in the reset position.	a) Loss of TR Data - PSF (-) parameter from the Pgmr. to the Instrumentation System Ground.	a) None	a) Ground observes a loss of Subframe #1 delayed time data.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) Loss of Subframe #1 delayed time data. (2) Crew can manually select the desired Pgmr. This restores lost data. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	---
	L M S	a) Pole D fails open in the reset position.	a) Loss of TR Data - PSF (+) parameter from the Pgmr. to the Prime Data Tape Recorder.	a) None	a) Ground observes a loss of delayed time data for Subframe #1.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) Loss of Subframe #1 delayed time data. (2) Crew can manually select the desired Pgmr. This restores lost data. (3) If failure occurs during an unmanned phase, ground cannot restore the lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #2" (K3-149) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) Loss of the 51.2 KB Data (OSR) parameter from the Pgmr. to the I/B.	a) None	a) Ground observes a loss of delayed time data for Subframes 2, 3 and 4.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) Loss of delayed time data for Subframes 2, 3 and 4. (2) Crew can manually select the desired Pgmr. This restores lost data. (3) If failure occurs during an unmanned phase, ground cannot restore the lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
		a) Pole F fails open in the reset position.	a) Loss of the RZ Timing parameter from the Pgmr. to the I/B.	a) None	a) Ground observes a loss of delayed time subframe data.	a) N/A	---
		b) Insulating film on contacts due to contamination	b) (1) Loss of delayed time subframe data. (2) Crew can manually select the desired Pgmr. This restores lost data. (3) If failure occurs during an unmanned phase, ground cannot restore the lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

NOTE: This relay is cycled to the latch position for manual selection of the desired Programmer. Since Programmer selection will normally be performed via DCS commands, the latch position functions are not documented.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #3" (K3-150) (52-79703-61) 3.6.24	L M S	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in this position for a nominal mission.	a) None	a) None	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	- - -
	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-148, -149, -152 and -153.	a) None	a) None	a) N/A	- - -
This Relay is Used for Command or Manual Mode of Programmer Selection	L M S	a) Pole C fails open in the reset position	a) Loss of Bit (5,6,7) parameter from the Pgmr. to the I/B.	a) None	a) Ground observes a loss of all analog data from the I/B and the Multiplexers.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Loss of analog data from the I/B and Multiplexers. (2) Crew can manuall select the desired Pgmr. This restores lost data. (3) If failure occurs during unmanned phase, ground cannot restore lost data. Mission not affected. Critical parameters for crew revisitation not affected.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) Loss of the Bit (2,3) parameter from the Pgmr. to the I/B.	a) None	a) Ground observes a loss of all analog data from the I/B and the Multiplexers.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) (1) Loss of analog data from the I/B and Multiplexers. (2) Crew can manually select the desired Pgmr. This restores lost data. (3) If failure occurs during unmanned phase, ground cannot restore lost data. Mission not affected. Critical parameters for crew revisitation not affected.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #3" (K3-150) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) Loss of R/T TM parameter from the Pgmr. to the TM Transmitter.	a) None	a) Ground observes a loss of R/T TM data.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) (1) No effect other than a loss of R/T RM data if failure occurs during storage. Delayed time data is not affected. (2) Crew can manually select the desired Pgmr. to restore R/T TM.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole F fails open in the reset position	a) Loss of the TR Clock parameter from the Programmer to the Tape Recorders.	a) None	a) Ground observes a loss of delayed time data.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) (1) No effect other than a loss of delayed time data if failure occurs during an unmanned phase. R/T TM data is not effected. (2) Crew can manually select the desired Pgmr. to restore delayed Prime Subframe Data.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
			NOTE: This relay is cycled to the latch position for manual selection of the desired Programmer. Since Programmer selection will normally be performed via DCS commands, the latch position functions are not documented.				

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #5" (K3-152) (52-79703-61) 3.6.25	L M S	a) Reset coil fails open.	a) None, Relay will be in the reset (CMD mode) position at lift-off and will remain in this position for a nominal mission.	a) None	a) None	a) N/A	—
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A used for GSE only - No effect.	a) None	a) None	a) None	a) N/A	—
This Relay is Used for Command or Manual Mode of Programmer Selection.	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-148, -149, -150, and -153.	a) None	a) None	a) N/A	—
	L M S	a) Pole D fails open in the reset position.	a) Loss of the Bit Rate (C_3 Shift Pulses) from the Pgmr. to the I/B.	a) None	a) Ground observes a loss of all delayed Time Subframe Data	a) N/A	—
		b) Insulating film on contacts due to contamination	b) (1) Loss of all delayed time subframe data. (2) Crew can manually select desired Pgmr. This restores lost data. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) Loss of the TMS Clock parameter from the Pgmr. to the I/B.	a) None	a) Ground observes a loss of 24 Bit parallel time in the experiment data and a loss of time is Subframes 2, 3, & 4.	a) N/A	—
		b) Insulating film on contacts due to contamination	b) (1) Loss of 24 Bit parallel time work to experiments and loss of time in Subframes 2, 3, & 4. (2) Crew can manually select the desired Pgmr. This restores lost data.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #5" (K3-152) (52-79703-61) (Continued)	L M S	a) Pole F fails open in the reset position.	a) Loss of the 12.8 KB (Word Rate) parameter from the Pgmr. to the I/B.	a) None	a) Loss of all data from the I/B.	a) N/A	---
		b) Insulating film on contacts due to contamination.	b) (1) Loss of all data from the I/B. (2) Crew can manually seleet desired Pgmr. (3) If failure occurs during an unmanned phase, ground cannot restore the lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole C fails open in the reset position.	a) Loss of the TRS CLK + parameter from the Electronic Time to the Pgmr.	a) None	a) Ground observes a of time information in TM data.	a) N/A	—
		b) Insulating film on contacts due to contamination	b)(1) Loss of time information for TM data. lGround will not be able to time correlate delayed time TM data. (2) Crew can manually select the desired Pgmr. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

NOTE - This relay is cycled to the latch position for manual selection of the desired Programmer. Since Programmer selection will normally be performed via DCS commands the latch position functions are not documented.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Programmer Select Mode Control Relay #6" (K3-153) (52-79703-61) 3.6.26 This relay is used for Command or Manual Mode of Programmer selection.	L M S	a) Pole A or Pole E Pole F used for GSE only - no effect.	a) None	a) None	a) None	a) N/A	----
	L M S	a) Pole B fails open in the reset or latch position.	a) None. Redundancy provided on Pole B of Relays K3-148, -149, -150, and -152.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole C or Pole D fails open in the reset or latch position.	a) Loss of Digital Sync (+) or Digital Request (+) circuits respectively to the Digital Interface from the Programmer.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The Digital Interface is not used.	b) None	b) None	b) IIIb	
	L M S	a) Reset coil or latch coil fails open.	a) None. This relay serves no function during the mission.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #7" (K3-154) (52-79703-61)	L M S	a) Pole A fails open in the reset position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
3.6.27	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy is provided by Pole B of Relays K3-231, -232 and -155.	a) None	a) None	a) N/A	---
This relay is used for Command or Manual Mode of Programmer selection.		b) Insulating film on contacts due to contamination.					
	L M S	a) Pole C fails open in the reset position.	a) None. Redundancy is provided by Pole D of Relay K3-154.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) None. Redundancy is provided by Pole C of Relay K3-154.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole E or Pole F fails open in the reset postion.	a) Loss of Digital Clock (+) or Digital Data (+) circuits respectively from the Digital Interface to the Programmer.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. The Digital Interface is not used.	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #1" (K3-154) (52- 79703-61) (Continued)	L M S	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in this position for a nominal mission.	a) None	a) None	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

NOTE: This relay cycled to the latch position for manual selection of the desired Programmer. Since Programmer selection will normally be performed via DCS commands, the latch position functions are not documented.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #8" (K3-155) (52-79703-61) 3.6.28	L M S	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in this position for a nominal mission.	a) None	a) None	a) N/A	---
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole A used for GSE only - no effect.	a) None	a) None	a) None	a) N/A	---
This Relay is used for Command or Manual Mode of Programmer Selection	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-231, -232 and -154.	a) None	a) None	a) N/A	---
	L M S	a) Pole C used for GSE only - no effect.	a) None	a) None	a) None	a) N/A	---
	L M S	a) Pole D fails open in the reset position.	a) Loss of the Request Elap. Time parameter from the Pgmr. to the Electronic Timer.	a) None	a) Ground observes loss of time information in TM data.	a) N/A	---
		b) Insulating film on contacts due to contamination	b)(1) Loss of time information for TM data. Ground will not be able to time correlate delayed time TM data. (2) Crew can manually select the desired Pgmr. (3) If the failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #8" (K3-155) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position. b) Insulating film on contacts due to contamination	a) Lost of the Request TR parameter from the Pgmr. to the Electronic Timer. b)(1) Loss of the DCS Reset Time on TM. Ground cannot read-out the TR Register. (2) Crew can manually select the desired Pgmr, or (3) Ground can update the Electronic Timer as necessary.	a) None b) None	a) Ground observes a loss of the DCS Reset Time (503). b)(1) Ground requests that the crew switch to the desired Pgmr, or (2) Ground keeps track of time and updates the Electronic Timer as necessary.	a) N/A b) IIIb	---
	L M S	a) Pole F fails open in the reset position. b) Insulating film on contacts due to contamination	a) Loss of the TRS Data + parameter from the Electronic Timer to the Pgmr. b)(1) Loss of time information for TM data. Ground will not be able to time correlate delayed time TM data. (2) Crew can manually select the desired Pgmr. (3) If the failure occurs during an unmanned phase, ground cannot restore lost parameter.	a) None b) None	a) Ground observes a loss of time information in TM data. b) Ground requests that the crew switch to the desired Pgmr.	a) N/A b) IIIb	---
			NOTE - This relay is cycled to the latch position for manual selection of the desired Programmer. Since Programmer selection will normally be performed via DCS commands, the latch position functions are not documented.				

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COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay # 11" (K3-231) (52-79703-61) 3.6.31	L M S	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in this position for a nominal mission.	a) None.	a) None.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A used for GSE only - No effect.	a) None.	a) None.	a) None.	a) N/A	- - -
This Relay is Used for Command or Manual Mode of Programmer Selection	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-232, -154, and -155.	a) None.	a) None.	a) N/A	- - -
	L M S	a) Pole C used for GSE only - No effect.	a) None.	a) None.	a) None.	a) N/A	- - -
	L M S	a) Pole D fails open in the reset position.	a) Loss of the Digital Insert parameter from the I/B to the Pgmr.	a) None.	a) Ground observes a loss of all digital data from the I/B and Muxes.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Loss of Digital Data from the I/B and the Muxes. (2) Crew can manually select the desired Pgmr. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None.	b) Ground requests that the crew select the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #11" (K3-231) (52-79703-61) (Continued)	L M S	a) Pole E fails open in the reset position.	a) Loss of the Fine Time Insert from the I/B to the Pgmr.	a) None.	a) Ground observes loss of Fine Time in Subframes 2, 3 and 4.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Loss of Fine Time in Subframes 2, 3, and 4. (2) Crew can manually select the desired Pgmr. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None.	b) Ground requests that the crew select the desired Pgmr.	b) IIIb	
	L M S	a) Pole F fails open in the reset position.	a) Loss of the PSC Sync # 3 parameter from the I/B to the Pgmr.	a) None.	a) Loss of PSC Sync Word 3 for Subframes 2, 3, and 4.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Loss of PSC Sync Word 3 for Subframes 2, 3, and 4. (2) Crew can manually select the desired Pgmr. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None.	b) Ground requests that the crew select the desired Pgmr.	b) IIIb	

NOTE - This relay is cycled to the latch position for manual selection of the desired Programmer. Since Programmer selection will normally be performed via DCS commands, the latch position functions are not documented.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay # 12" (K3-232) (52-79703-61) 3.6.32	L M S	a) Reset coil fails open.	a) None. Relay will be in the reset (CMD mode) position at lift-off and will remain in this position for a nominal mission.	a) None.	a) None.	a) N/A	- - -
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None.	b) None.	b) None.	b) IIIb	
	L M S	a) Pole A used for GSE only - no effect.	a) None.	a) None.	a) None.	a) N/A	- - -
This Relay is used for Command or Manual Mode Programmer Selection	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy provided on Pole B of Relays K3-231, -154, and -155.	a) None.	a) None.	a) N/A	- - -
	L M S	a) Pole C fails open in the reset position.	a) Loss of the PSC Sync # 2 parameter from the I/B to the Pgmr.	a) None.	a) Ground observes a loss of PSC Sync Word # 2 for Subframes 2, 3, and 4.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Loss of PSC Sync Word #2 for Subframes 2, 3, and 4. (2) Crew can manually select the desired Pgmr. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None.	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Programmer Select Mode Control Relay #12" (K3-232) (52-79703-61) (Continued)	L M S	a) Pole D fails open in the reset position.	a) Loss of the PSC Sync # 1 parameter from the I/B to the Pgmr.	a) None.	a) Ground observes a loss of PSC Sync Word 3 for Subframes 2, 3 and 4.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Loss of PSC Sync Word 3 for Subframes 2, 3, and 4. (2) Crew can manually select the desired Pgrm. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	b) None.	b) Ground requests that the crew switch to the desired Pgmr.	b) IIIb	
	L M S	a) Pole E fails open in the reset positinn. b) Insulating film on contacts due to contamination.	a) Loss of the HL Data Switch from the I/B to the Pgmr. b) (1) Loss of MFC n5, n6, n7, n8, n9 and n10 data. (2) Crew can manually select the desired Pgmr. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter.	a) None. b) None.	a) Ground observes a loss of MFC n5, n6, n7, n8, n9, n10 data. b) Ground requests that the crew switch to the desired Pgmr.	a) N/A b) IIIb	- - -
		a) Pole F fails open in the reset position. b) Insulating film on contacts due to contamination	a) Loss of TMS Data parameter from the Pgmr. to the I/B. b) (1) Loss of the 24 Bit Parallel Time Word and a loss of the Fine Time & Coarse Time in Subframes 2, 3, and 4. (2) Crew can manually select the desired Pgmr. (3) If failure occurs during an unmanned phase, ground cannot restore lost parameter	a) None. b) None.	a) Ground observes: o Loss of 24 Bit Time Word. o Loss of Fine Time and Course Time in Subframes 2, 3, & 4. b) Ground requests that the crew switch to the desired Pgmr.	a) N/A	- - -

NOTE: This relay is cycled to the latch position for manual selection of the desired Programmer. Since Programmer selection will normally be performed via DCS commands, the latch position functions are not documented.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Resistor, Wire-wound Power, RER-70, 75 ± 1%, 15w, MIL-R-39009A (Resistor connected to Pole B of Relay K3-309) 3.6.36	M	a) Resistor fails open.	a) There is a loss of dummy load for Bus B when Bus B is the Experiment Recorder bus.	a) None	a) Ground may observe a slight loss of regulation on the -24 VDC Experiment Bus Conv output during Experiment Recorder switching. This data is on Channel M521.	a) N/A	----
		b) Mechanical or thermal stress.	b) None.	b) None	b) Ground can switch to Bus B for the PCM Equipment, and Bus A for the Experiment Recorders.	b) IIIb	
Relay, Latching, "PCM Bus Select Relay #7" (K3-309) (52-79703-61) 3.6.38	L M S	a) Pole A fails open in the reset position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
This relay is part of the logic for selecting Bus A or Bus B as the PCM Bus. Bus A is normally the PCM Bus.	L M S	a) Pole B fails open in the reset position.	a) None. Redundancy is provided by Pole E of Relay K3-309.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) None. Redundancy is provided on Pole B of Relay K3-309.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #7" (K3-309) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) None. Redundancy is provided on Pole D of Relay K3-309.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) None. Redundancy is provided on Pole C of Relay K3-309.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole F fails open in the reset position.	a) Loss of power to the QCM Monitor. This results in a loss of QCM data.	a) None	a) Ground observes loss of QCM data (MO15-MO26).	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. QCM data is not mission essential. Data cannot be restored.	b) None	b) Ground requests that the crew check the QCM Monitor circuit breaker (3-125).	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. This relay is in the reset position at lift-off and is expected to remain in this position for a normal mission.	a) None	a) None	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

NOTE: The latch position functions are not documented. The latch position is required only in the event of a prior failure which requires that the PCM System be switched to Bus B power.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay # 10" (K3-327) (52-79703-61) 3.6.39 This relay is part of the logic for selecting Bus A or Bus B as the PCM Bus. Bus A is normally the PCM Bus.	L M S	a) Pole F fails open in the reset position.	a) None. Redundancy is provided on Pole E of Relay K3-327.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole E fails open in the reset position.	a) None. Redundancy is provided on Pole F of Relay K3-327.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Pole D fails open in the reset position.	a) (1) Ground cannot dump the Exp 2 Rcdr.	a) None	a) (1) Data from the Exp 2 Rcdr is not received when a dump is commanded. (2) The Tape Motion Monitor channel for the Exp 2 Rcdr indicates there is no tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data from the Exp 2 Rcdr. Ground can switch to Bus B as the PCM Bus.	b) None	b) (1) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. This relay is in the reset position at lift-off, and is expected to remain in this position for a normal mission.	a) None	a) None	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay # 10" (K3-327) (52-79703-61) (Continued)	L M S	a) Pole C fails open in the reset position.	a) Power is not supplied to the Exp 2 Rcdr when the ground commands Data 2 Record.	a) None	a) (1) When ground commands Data 2 Record, the Exp 2 Tape Motion Monitor channel (normally K510) indicates there is no tape motion. (2) Data 2 is not received when ground dumps the Data 2 Rcdr.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None. Ground can switch to Bus B as the PCM Bus. This restores power to the Rcdr for Recording Data 2.	b) None	b) Ground switches to Bus B for the PCM Bus.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) There is a temporary loss of capability to control most of the Exp 2 Rcdr functions.	a) (1) If the Exp 2 Rcdr is recording or dumping data when the failure occurs, the Exp 2 Rcdr (normally T/R #3) "STOP" light (located on Panel 204) comes on when the end-of-tape is reached.	a) (1) Data from the Exp 2 Rcdr is not received when a dump is commanded.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data from the Exp 2 Rcdr. Ground can switch to Bus B as the PCM Bus.	b) (1) Crew checks the switches and circuit breakers which could be associated with the observed anomaly. (2) Crew informs the ground of the anomaly.	b) (1) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole A fails open in the reset position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

NOTE: The latch position functions are not documented. The latch position is required only in the event of a prior failure which requires that the PCM System be switched to Bus B power.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #2" (K3-302) (52-79703-61) 3.6.40 This relay is part of the logic for selecting Bus A or Bus B as the PCM Bus. Bus A is normally the PCM Bus.	L M S	a) Pole F or Pole E fails open in the reset position.	a) There is a loss of the subframe 1 interface between the Programmer and the Data Recorder. This results in a loss of delayed time subframe 1 data.	a) None	a) (1) Ground observes a loss of delayed time subframe 1 data. (2) The tape motion monitor channel for the Data Rcdr (normally T/R #1) indicates there is tape motion.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of delayed time subframe 1 data. Ground can switch to Bus B as the PCM Bus. This restores delayed subframe 1 data.	b) None	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole D or Pole C fails open in the reset position.	a) Loss of R/T TM interface between the Programmer and the TM Transmitter. This results in a loss of R/T TM data.	a) None	a) (1) Ground observes a loss of R/T TM data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of R/T TM data. Ground can switch to Bus B as the PCM Bus. This restores R/T TM data.	b) None	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	
	L M S	a) Pole B fails open in the reset position.	a) Loss of T/R Clock from the Programmer to the Tape Recorders.	a) None	a) Ground observes loss of subframe 1, 2, 3, and 4 delayed time data.	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) Temporary loss of subframe 1, 2, 3 and 4 delayed time data. Ground can switch to Bus B for the PCM Bus. This restores subframe 1, 2, 3 and 4 delayed time data.	b) None	b) Ground switches to Bus B as the PCM Bus.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "PCM Bus Select Relay #2" (K3-302) (52-79703-61) (Continued)	L M S	a) Pole A fails open in the reset position.	a) None - GSE use only.	a) None	a) None	a) N/A	----
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	L M S	a) Reset coil fails open.	a) None. This relay is in the reset position at lift-off and is expected to remain in this position for a normal mission.	a) None	a) None	a) N/A	----
		b) Defective wire or terminal due to mechanical or thermal stress.	b) None	b) None	b) None	b) IIIb	

NOTE: The latch position functions are not documented. The latch position is required only in the event of a prior failure which requires that the PCM System be switched to Bus B power.

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Man. Control Relay #1" (K3-277) (52-79703-61)	M	a) Pole F fails open in the reset position.	a) None. Pole F is not functional in this position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
3.7.1 This relay is part of the logic for Manual vs. DCS control of the recording of Prime Data, i.e. subframe 1. The relay is controlled by the "DATA" switch located on Panel 204.	M	a) Pole F fails open in the latch position.	a) Power is not applied to the "TAPE RECORDING DATA RECORD" light (located on Panel 204) when the crew switches the "DATA" switch (located on Panel 204) to the "RECORD" position.	a) The "TAPE RECORDING DATA RECORD" light does not come on when the "DATA" switch is switched to the "RECORD" position.	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None. "DATA RECORD" light operation is not a requirement for recording subframe 1 data. Also, the ground normally controls the Data Rcdr.	b) (1) Crew checks the switches and circuit breakers of equipment associated with the anomaly. (2) Crew switches the "LIGHTING STATUS" switch (located on Panel 207) to the "TEST" position. "DATA RECORD" light comes ON. (3) Crew observes that associated Tape Rcdr. "STOP" light (located on Panel 204) is not illuminated. Crew notes that Data Rcdr. sounds and feels like tape drive motor is running. (4) Crew informs ground of observed anomaly.	b) (1) Ground verifies that the Data Rcdr. Tape Motion Monitor channel (normally K508) indicates there is tape motion.	b) IIIb	
	M	a) Pole E fails open in the reset position	a) None. Pole E is not functional in the reset position.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	
	M						

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Data Record Man. Control Relay #1" (K3-277) (52-79703-61) (Continued)	M	a) Pole E fails open in the latch position.	a) When the crew switches the "DATA" switch (located on Panel 204) to the "RECORD" position, power is not applied to the following equipment: o MDA Signal Conditioner. o OWS -1 and -2 Signal Conditioners. This results in a loss of data from these Signal Conditioners.	a) None	a) Ground observes a loss of data from the MDA, OWS -1 and OWS -2 Signal Conditioners.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) Temporary loss of data. Power to these Signal Conditioners can be restored by the crew or the ground.	b) None	b) (1) Ground can restore power by commanding Data-Record (S376), or (2) Ground requests that crew restore power to the Signal Conditioners by recording voice.	b) IIIb	
	M	a) Pole D fails open in the reset position.	a) Power is not removed from the PCM Bus Conv when the "DATA" switch is switched from the "RECORD" to the "OFF" position.	a) None	a) None, other than a possible increase of the PCM Bus Conv temperature after periods when the Conv is supposed to have been powered-down.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None, other than excessive power consumption. Power is removed when the "DATA" switch is positioned in the "CMD" position.		b) None, unless the temperature of the Conv exceeds the acceptable value. If necessary, ground requests that the crew return the "DATA" switch to its normal "CMD" position. This removes power from the Conv.		

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Manual Control Relay #1" (K3-277) (52-79703-61) (Continued)	M	a) Pole D fails open in the latch position.	a) Power is not applied to the PCM Bus Conv when the crew switches the "DATA" switch to the "RECORD" position. This results in a loss of necessary power for recording subframe 1 data.	a) The "DATA RECORD" light does not come ON. This indicates there is no tape motion in the Data Rcdr (normally T/R #1).	a) There is a loss of recorded subframe 1 data.	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) (1) Temporary loss of data. Crew or ground can restore power to the PCM Bus Conv. (2) Power is restored by any of the following methods: o Crew momentarily recording voice. o Ground controlling the recording of subframe 1 data. o Crew momentarily switching an Exp. 1 or Exp. 2 switch to the "RECORD" position.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew checks the Data Recorder to determine via touch and audio sense whether the Rcdr is running. (3) Crew can test the Data Rcdr "STOP" and "DATA" lights via the "LIGHTS STATUS" switch (located on Panel 207). (4) Crew informs ground of the observed anomaly.	b) (1) Ground informs crew of loss of recorded subframe 1 data. (2) Ground coordinates with the crew to determine which corrective action method will be used.	b) IIIb	
	M	a) Pole A fails open in the reset or latch position.	a) None - GSE use only.	a) None	a) None	a) N/A	- - -
		b) Insulating film on contacts due to contamination.	b) None	b) None	b) None	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Manual Control Relay #1" (K3-277) (52-79703-61) (Continued)	M	a) Pole C fails open in the reset position.	a) (1) When the "DATA" switch is switched from the "RECORD" to the "OFF" position, if the PCM Bus Conv is still powered-up to provide power for other equipment, power will not be removed from the Data Rcdr. The Rcdr will continue to run to the end-of-tape. Rcdr will not be damaged. When the PCM Bus Conv is powered-down, power is removed from the Rcdr. (2) When the "DATA" switch is switched to the "CMD" position, there is no effect. Redundancy is provided by Relays K3-275 and K3-202.	a) When the "DATA' switch is switched from the "RECORD" to the "OFF" position, if the PCM Bus Conv is still powered-up for other equipment, the "DATA RECORD" light does not go off until the end-of-tape is reached. Then the Data Rcdr "STOP" light will come on.	a) (1) If R/T TM is being received, the Data Rcdr Tape Motion Monitor channel (normally K508) indicates there is tape motion even though the crew has informed ground that the "DATA" switch from the "RECORD" to the "OFF" position.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. The Data Rcdr functions are normally controlled by the ground except for voice recording.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the anomaly. (2) Crew informs ground of the observed anomaly.	b) (1) Ground requests that the crew switch the "DATA" switch to the "CMD" position. Power can then be removed from the Data Rcdr even though the PCM Bus Conv may be powered-up.	b) IIIb	
	M	a) Pole C fails open in the latch position.	a) When the "DATA" switch is switched to the "RECORD" position, power is not applied to the Data Rcdr.	a) The "DATA RECORD" light does not come on.	a) (1) Recorded subframe 1 data is not received for the time interval during which power was supposed to be supplied to the Data Rcdr.	a) N/A	- - -
		b) Insulating film on contacts due to contamination	b) None. Power can be restored to the Data Rcdr by the crew.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew momentarily switches one of the voice record switches to the "RECORD" position. Power is applied to the Data Rcdr and the "DATA RECORD" comes on.	b) Ground informs crew of observed anomaly and recommends that when crew manually records subframe 1 data, they should momentarily switch one of the voice record switches to the "RECORD" position.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching "Data Record Manual Control Relay #1" (K3-277) (52-79703-61) (Continued)	M	a) (1) Pole B fails open in the reset position, or (2) Latch coil fails open.	a) When the "DATA" switch is switched to the "RECORD" position, Relay K3-277 will not cycle to the latch position. This results in: o Loss of power to the MDA, OWS -1 and OWS -2 Signal Conditioners. o Loss of power to the PCM Bus Conv. o Loss of power to the Data Rcdr.	a) The "DATA RECORD" light does not come on.	a) Loss of recorded subframe 1 data.	a) N/A	- - -
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Temporary loss of delayed subframe 1 data. Ground normally controls the Data Rcdr.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew momentarily switches one of the voice record switches to the "RECORD" position. This restores power to all affected components except the "DATA RECORD" light. The voice record light comes on. This indicates Data Rcdr has received power and has tape motion. However, when voice record switch returns to the "OFF" position, power is removed from the previously affected components. (3) Crew informs ground of the anomaly and requests that the ground resume control of the Data Rcdr.			

* COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Latching, "Data Record Manual Control Relay #1" (K3-277) (52-79703-61) (Continued)	M	a) (1) Pole B fails open in the latch position, or (2) Reset coil fails open.	a) (1) When the "DATA" switch is switched to the "OFF" position from the "RECORD" position, Relay K3-277 will not cycle to the reset position. This results in the continued application of power to the following equipment: o PCM Bus Conv. o Data Rcdr and the "DATA RECORD" light. o MDA, OWS -1 and OWS -2 Signal Conditioners. (2) There is no effect on system operation when the "DATA" switch is switched to the "CMD" position.	a) (1) The "DATA RECORD" light does not extinguish when the "DATA" switch is switched from the "RECORD" to the "OFF" position. (2) If the Data Rcdr continues to operate until the end-of-tape is reached, the Data Rcdr "STOP" light comes on.	a) If R/T TM is being received, the Data Rcdr Tape Motion Monitor channel (normally K508) indicates there is tape motion even though the crew has informed the ground that the "DATA" switch has been switched from the "RECORD" to the "OFF" position.	a) N/A	
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to contamination.	b) None. The Rcdr is not damaged if it reaches the end-of-tape. The Data Rcdr functions are normally controlled by the ground except for voice recording.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the observed anomaly. (2) Crew informs ground of the observed anomaly.	b) Ground requests that the crew reconfigure the Data Rcdr for DCS control.	b) IIIb	- - -

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Data Record Manual Control Relay #2" (K3-278) (52-79715-13) 3.7.2	M	a) (1) Pole A fails open when the coil is energized, or (2) The coil fails open when Relay K3-277 is in the reset position.	a) When the "DATA" switch is switched to the "RECORD" position, Relay K3-277 will not cycle to the latch position. This results in: o Loss of power to the MDA, OWS -1 and OWS -2 Signal Conditioners. o Loss of power to the PCM Bus Conv. o Loss of power to the Data Rcdr.	a) The "DATA RECORD" light does not come on.	a) Loss of recorded subframe 1 data.	a) N/A	- - -
This relay is used to control the cycling of Relay K3-277.		b) (1) Insulating film in contacts due to contamination. (2) Defective wire or terminal due to mechanical or thermal stress.	b) Temporary loss of recorded subframe 1 data. Ground normally controls the Data Rcdr.	b) (1) Crew switches the "LIGHTING STATUS" switch to the "TEST" position. The "DATA RECORD" light tests good. (2) Crew momentarily switches one of the voice record switches to the "RECORD" position. This restores power to all affected components except the "DATA RECORD" light. The voice record light comes on. This indicates Data Rcdr has received power and has tape motion. However, when voice record switch returns to the "OFF" position, power is removed from the previously affected components. (3) Crew informs ground of the anomaly and requests that the ground resume control of the Data Rcdr.	b) (1) Ground requests that the crew reconfigure the Data Rcdr for DCS control.	b) IIIb	

COMPONENT	MISSION PHASE	a) FAILURE MODE b) MOST PROBABLE FAILURE CAUSE	FAILURE EFFECT a) SYSTEMS b) MISSION	CREW a) INDICATION b) ACTION	GROUND a) INDICATION b) ACTION	a) TIME TO ABORT (HRS) b) FAILURE CATEGORY	RECOMMENDATIONS
Relay, Slow Release, "Data Record Manual Control Relay #2" (K3-278) (52-79715-13) (Continued)	M	a) (1) Pole B fails open in the latch position, or (2) Reset coil fails open.	a) (1) When the "DATA" switch is switched to the "OFF" position from the "RECORD" position, Relay K3-277 will not cycle to the reset position. This results in the continued application of power to the following equipment: o PCM Bus Conv. o Data Rcdr and the "DATA RECORD" light. o MDA, OWS -1 and OWS -2 Signal Conditioners. (2) There is no effect on system operation when the "DATA" switch is switched to the "CMD" position.	a) (1) The "DATA RECORD" light does not extinguish when the "DATA" switch is switched from the "RECORD" to the "OFF" position. (2) If the Data Rcdr continues to operate until the end-of-tape is reached, the Data Rcdr "STOP" light comes on.	a) If R/T TM is being received, the Data Rcdr Tape Motion. Monitor channel (normally K508) indicates there is tape motion even though the crew has informed ground that the "DATA" switch has been switched from the "RECORD" to the "OFF" position.	a) N/A	
		b) (1) Insulating film on contacts due to contamination. (2) Defective wire or terminal due to contamination.	b) None. The Rcdr is not damaged if it reaches the end-of-tape. The Data Rcdr functions are normally controlled by the ground except for voice recording.	b) (1) Crew checks the switches and circuit breakers for associated equipment which could cause the observed anomaly. (2) Crew informs ground of the observed anomaly.	b) Ground requests that the crew reconfigure the Data Rcdr for DCS control.	b) IIIb	

TO CONTINUE PLEASE REFER TO PART 2 OF THIS MANUAL